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United States
Department of
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Soil
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Service

In cooperation with
South Dakota Agricultural
Experiment Station

Soil Survey of Potter County, South Dakota

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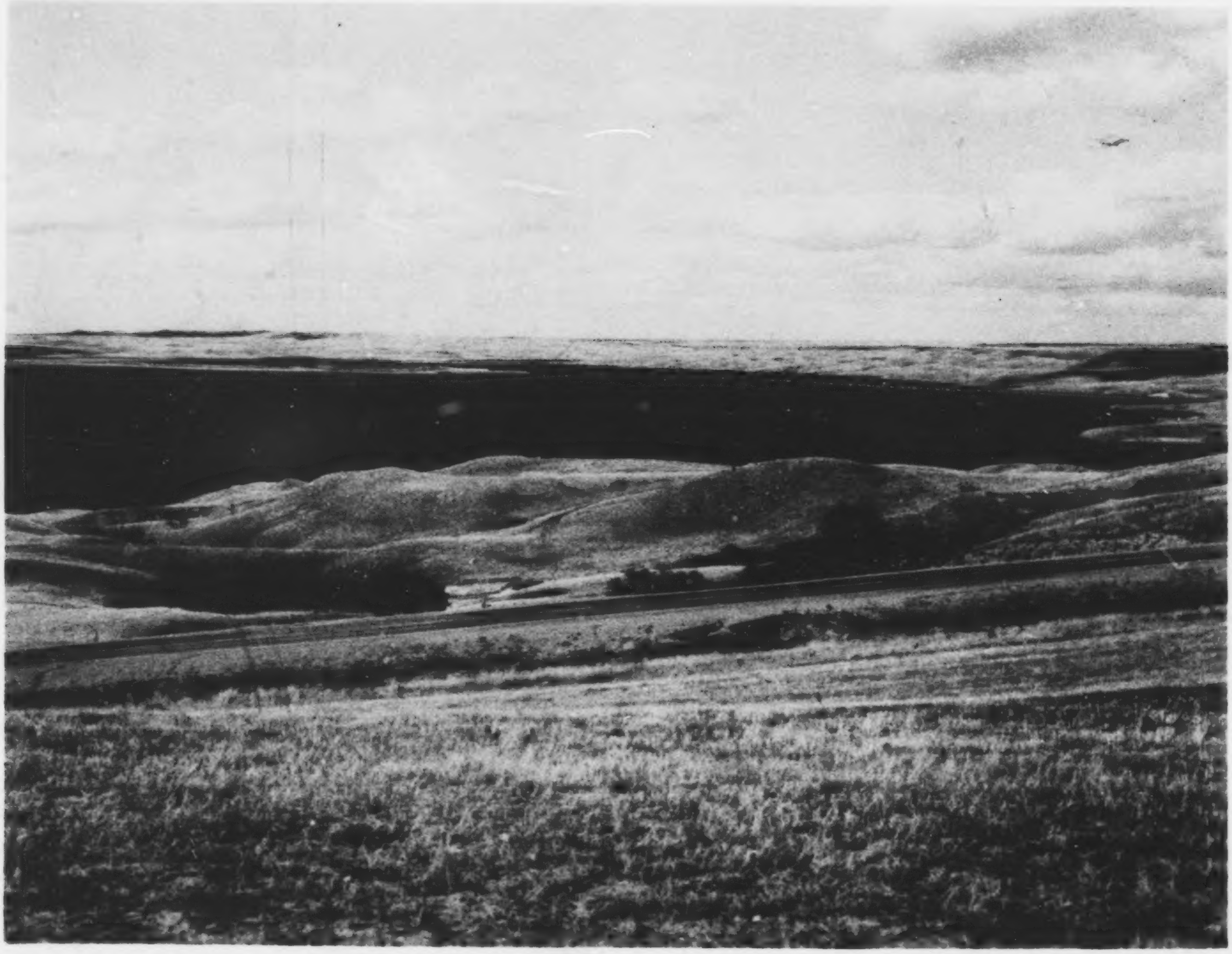

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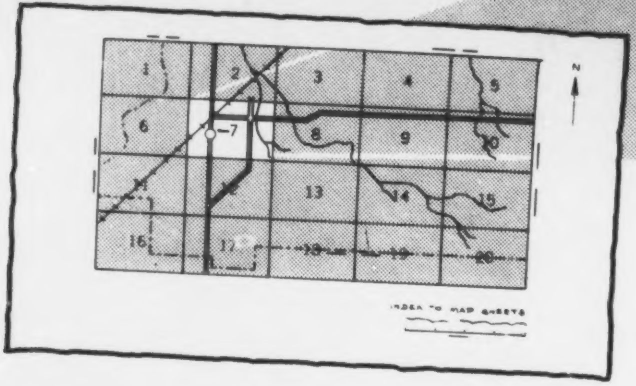
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INDEX TO MAP SHEETS

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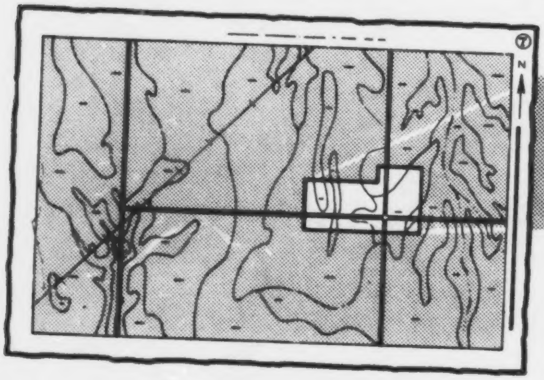

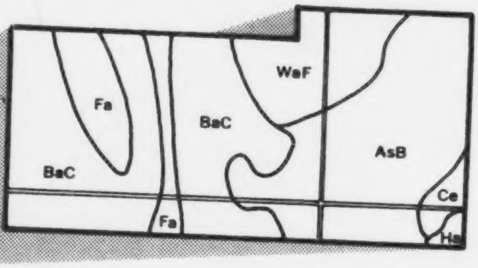
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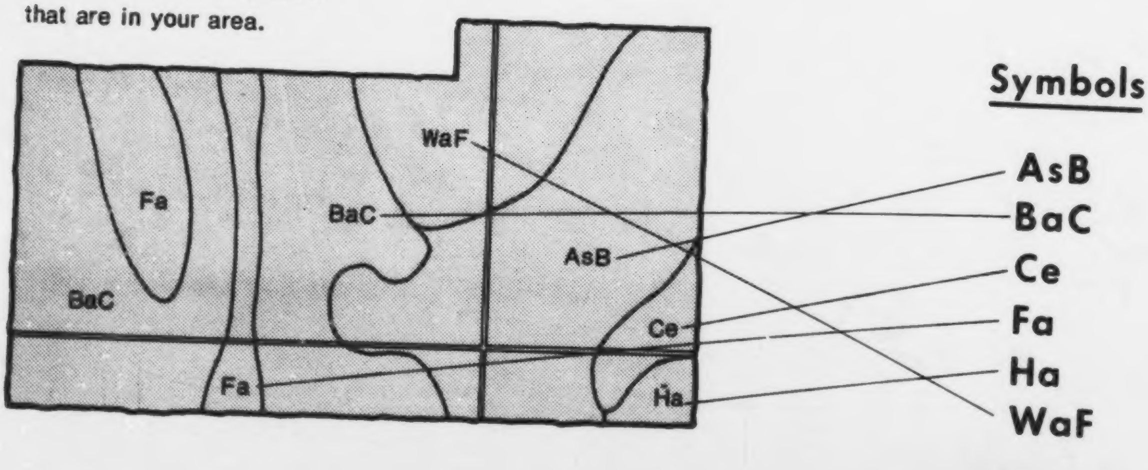
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THIS SOIL SURVEY

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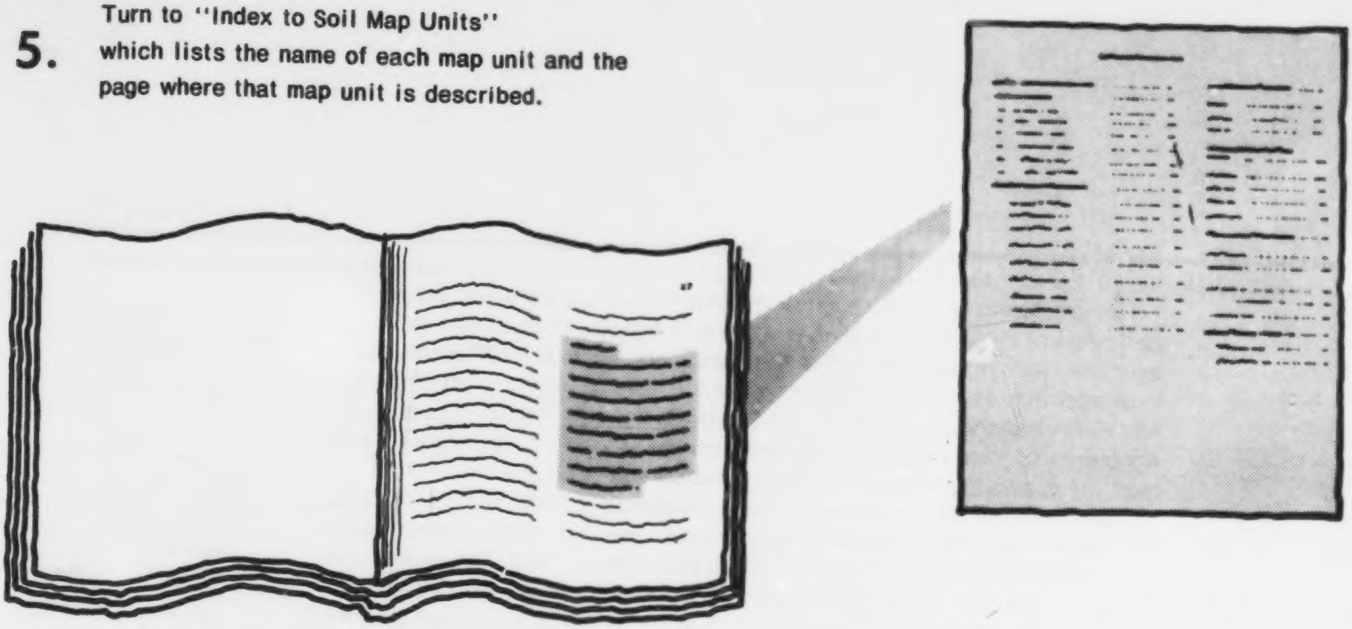
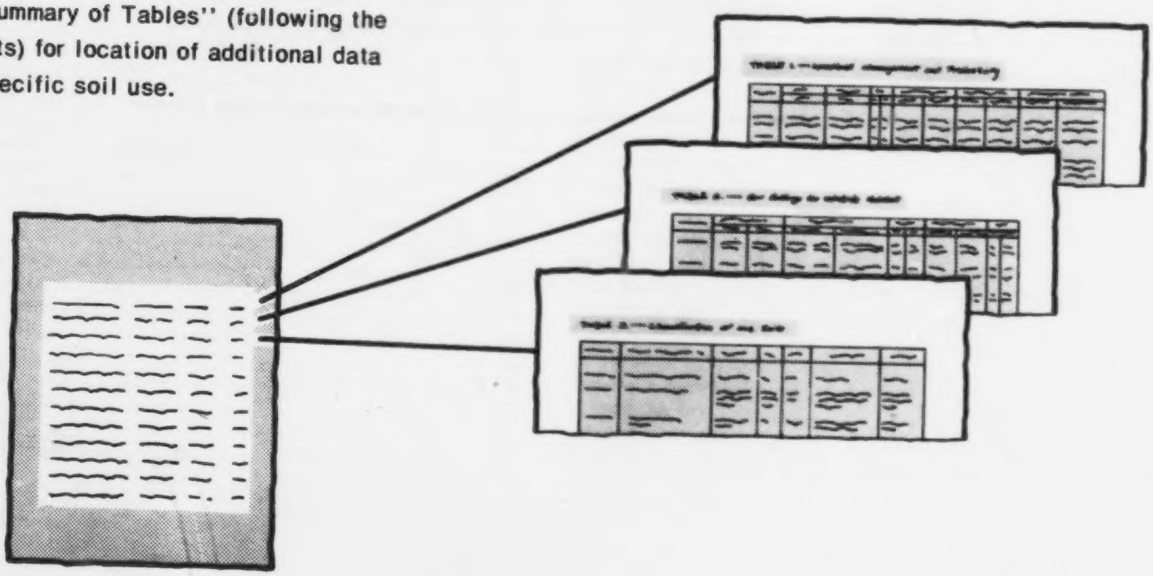


6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in 1982. Soil names and descriptions were approved in 1983. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1983. This survey was made cooperatively by the Soil Conservation Service and the South Dakota Agricultural Experimental Station. It is part of the technical assistance furnished to the Potter County Conservation District. Some financial assistance was provided by the South Dakota Department of Revenue and the Potter County Commissioner.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: An area of the Betts-Gettys complex, stony, 15 to 60 percent slopes. Lake Oahe is in the background.

Contents

Index to map units iv
Summary of tables v
Foreword vii
General nature of the county 1
How this survey was made 3
  Map unit composition 3
General soil map units 5
  Soil descriptions 5
Detailed soil map units 13
  Soil descriptions 13
Prime farmland 47
Use and management of the soils 49
  Crops and pasture 49
  Rangeland 51
  Native woods and windbreaks and environmental plantings 52
  Recreation 54
  Wildlife habitat 54
  Engineering 56
Soil properties 61
  Engineering index properties 61
  Physical and chemical properties 62
  Soil and water features 63
  Engineering index test data 65
Classification of the soils 67
Soil series and their morphology 67
Formation of the soils 89
References 91
Glossary 93
Tables 99

Soil Series

Agar series 67
Betts series 68
Bon series 68
Cavo series 69
Davison series 70
DeGrey series 70
Delmont series 70
Durrstein series 71
Eakin series 71
Gettys series 72
Glenham series 73
Highmore series 73
Hoven series 74
Hurley series 74
Java series 75
Jerauld series 76
Lowry series 76
Mobridge series 77
Oahe series 78
Okaton series 79
Opal series 79
Peno series 80
Plankinton series 80
Promise series 81
Prosper series 81
Raber series 82
Ranslo series 83
Ree series 83
Regan series 84
Sansarc series 84
Schamber series 85
Tetonka series 85
Walke series 86
Wendte series 86
Worthing series 87

Issued October 1985

Index to Map Units

AgA—Agar silt loam, 0 to 2 percent slopes................ 13
AgB—Agar silt loam, 2 to 6 percent slopes................ 14
AmA—Agar-Mobridge silt loams, 0 to 3 percent slopes........ 14
AoA—Agar-Mobridge-Tetonka silt loams, 0 to 3 percent slopes........ 15
BgE—Betts-Gettys complex, stony, 15 to 60 percent slopes........ 15
BkE—Betts-Java loams, 9 to 25 percent slopes......... 16
Bo—Bon loam........ 16
Bv—Bon loam, channeled........ 17
CaA—Cavo loam, 0 to 2 percent slopes........ 17
Da—Davison loam........ 18
De—DeGrey silt loam........ 18
DmA—Delmont loam, 0 to 2 percent slopes........ 19
DsD—Delmont-Schamber complex, 6 to 15 percent slopes........ 19
Du—Durrstein silt loam........ 19
EaA—Eakin silt loam, 0 to 2 percent slopes........ 20
EpB—Eakin-Peno complex, 2 to 6 percent slopes..... 20
EpC—Eakin-Peno complex, 6 to 9 percent slopes..... 21
GeF—Gettys clay loam, 25 to 40 percent slopes...... 21
GlA—Glenham loam, 0 to 2 percent slopes........ 22
GpB—Glenham-Plankinton complex, 0 to 4 percent slopes........ 22
GrA—Glenham-Prosper loams, 0 to 3 percent slopes........ 23
GrB—Glenham-Prosper loams, 1 to 6 percent slopes........ 23
HbA—Highmore silt loam, 0 to 2 percent slopes........ 24
HbB—Highmore silt loam, 2 to 6 percent slopes........ 24
HbC—Highmore silt loam, 6 to 9 percent slopes........ 25
HdA—Highmore-DeGrey silt loams, 0 to 2 percent slopes........ 26
HfA—Highmore-Mobridge silt loams, 0 to 3 percent slopes........ 26
HgB—Highmore-Peno complex, stony, 2 to 6 percent slopes........ 27
HgC—Highmore-Peno complex, stony, 6 to 9 percent slopes........ 28
Ho—Hoven silt loam........ 28
Hu—Hurley silt loam........ 29
Hz—Hurley-Slickspots complex........ 29
JbC—Java-Betts loams, 6 to 9 percent slopes........ 30
JgB—Java-Glenham loams, 2 to 6 percent slopes.... 31
JmE—Java-Schamber complex, 9 to 25 percent slopes........ 31
Jr—Jerauld silt loam........ 32
LoA—Lowry silt loam, 0 to 2 percent slopes........ 32
LoB—Lowry silt loam, 2 to 6 percent slopes........ 33
LoC—Lowry silt loam, 6 to 9 percent slopes........ 33
LpC—Lowry-Peno complex, 6 to 9 percent slopes.... 33
LpD—Lowry-Peno complex, 9 to 15 percent slopes.. 34
Mo—Mobridge silt loam........ 35
OaA—Oahe loam, 0 to 2 percent slopes........ 35
OaB—Oahe loam, 2 to 6 percent slopes........ 35
OdB—Oahe-Delmont loams, 2 to 6 percent slopes... 36
OkF—Okaton silty clay, 15 to 40 percent slopes....... 36
OpB—Opal clay, 2 to 6 percent slopes........ 36
OpC—Opal clay, 6 to 9 percent slopes........ 37
OsD—Opal-Sansarc clays, 9 to 25 percent slopes.... 37
Pa—Pits, gravel........ 38
Pk—Plankinton silt loam........ 38
PrA—Promise clay, 0 to 2 percent slopes........ 38
PrB—Promise clay, 2 to 6 percent slopes........ 39
RaA—Raber loam, 0 to 2 percent slopes........ 39
RaB—Raber loam, 2 to 6 percent slopes........ 40
RcA—Raber-Cavo loams, 0 to 2 percent slopes........ 40
RcB—Raber-Cavo loams, 2 to 6 percent slopes........ 41
RgD—Raber-Gettys complex, 9 to 25 percent slopes........ 42
RhC—Raber-Peno loams, 6 to 9 percent slopes........ 42
Rn—Ranslo silt loam........ 43
Rr—Ranslo-Durrstein silt loams........ 43
RsA—Ree loam, 0 to 2 percent slopes........ 44
Rt—Regan silt loam........ 44
SaF—Sansarc clay, 15 to 40 percent slopes........ 44
ScF—Schamber gravelly loam, 15 to 60 percent slopes........ 45
Te—Tetonka silt loam........ 45
Wa—Walke silt loam........ 46
Wf—Wendte silty clay loam, channeled........ 46
Wo—Worthing silty clay loam........ 46
Wp—Worthing silty clay loam, ponded........ 47

Summary of Tables

Temperature and precipitation (table 1) 100

Freeze dates in spring and fall (table 2) 101
Probability. Minimum temperature.

Growing season (table 3) 101

Acreage and proportionate extent of the soils (table 4) 102
Acres. Percent.

Prime Farmland (table 5) 103

Land capability and yields per acre of crops and pasture (table 6) 104
Land capability. Corn. Oats. Winter wheat. Alfalfa hay. Brome-alfalfa.

Rangeland productivity (table 7) 108
Range site name. Potential annual production.

Windbreaks and environmental plantings (table 8) 112

Recreational development (table 9) 119
Camp areas. Picnic areas. Playgrounds. Paths and trails.

Wildlife habitat (table 10) 125

Building site development (table 11) 129
Shallow excavations. Dwellings without basements. Dwellings with basements. Small commercial buildings. Local roads and streets.

Sanitary facilities (table 12) 135
Septic tank absorption fields. Sewage lagoon areas. Trench sanitary landfill. Area sanitary landfill. Daily cover for landfill.

Construction materials (table 13) 142
Roadfill. Sand. Gravel. Topsoil.

Water management (table 14) 148
Limitations for—Pond reservoir areas; Embankments, dikes, and levees. Features affecting—Drainage, Irrigation, Terraces and diversions, Grassed waterways.

Engineering index properties (table 15) 153
Depth. USDA texture. Classification—Unified, AASHTO. Fragments greater than 3 inches. Percentage passing sieve number—4, 10, 40, 200. Liquid limit. Plasticity index.

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Physical and chemical properties of the soils (table 16) 161
Depth. Clay. Moist bulk density. Permeability. Available water capacity. Soil reaction. Salinity. Shrink-swell potential. Erosion factors. Wind erodibility group. Organic matter.

Soil and water features (table 17) 166
Hydrologic group. Flooding. High water table. Bedrock. Potential frost action. Risk of corrosion.

Engineering index test data (table 18) 171
Classification. Grain-size distribution. Liquid limit. Plasticity index. Moisture density.

Classification of the soils (table 19) 172
Family or higher taxonomic class.

Foreword

This soil survey contains information that can be used in land-planning programs in Potter County, South Dakota. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

R. D. Swenson

R. D. Swenson
State Conservationist
Soil Conservation Service

Soil Survey of
Potter County, South Dakota

By Allen A. Faulkner, Soil Conservation Service

Soils surveyed by Allen A. Faulkner, Ralph E. Bond,
and James A. Clausen, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service,
in cooperation with
the South Dakota Agricultural Experiment Station

Potter County is in the north-central part of South Dakota (fig. 1). It has a total land area of 553,967 acres. According to the 1980 census, it has a population of 3,674. Gettysburg, the county seat, has a population of 1,023. Hoven has a population of 615, Lebanon one of 129, and Tolstoy one of 97.

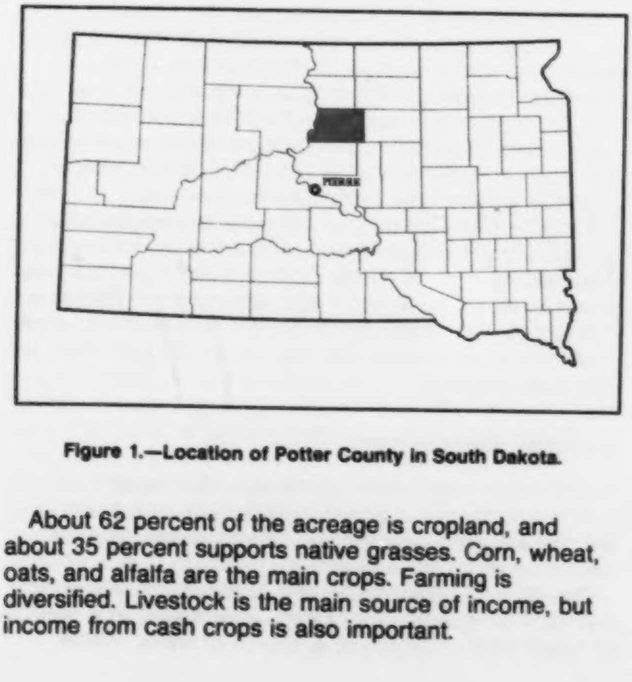

Figure 1.—Location of Potter County in South Dakota.

About 62 percent of the acreage is cropland, and about 35 percent supports native grasses. Corn, wheat, oats, and alfalfa are the main crops. Farming is diversified. Livestock is the main source of income, but income from cash crops is also important.

General Nature of the County

This section gives general information concerning the county. It describes climate; physiography, relief, and drainage; settlement; farming; and natural resources.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Potter County is usually quite warm in summer, but hot spells are frequent and cool days occasional. The county is very cold in winter, when arctic air frequently surges over the area. Most precipitation falls during the warm period, and rainfall is heaviest late in spring and early in summer. Winter snowfall is normally not too heavy, and it is blown into drifts, so that much of the ground is free of snow.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Gettysburg, South Dakota, in the period 1951 to 1979. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 16 degrees F, and the average daily minimum temperature is 6 degrees. The lowest temperature on record, which occurred at Gettysburg on January 29, 1966, is -33 degrees. In summer the average temperature is 70 degrees, and the average daily maximum temperature is 84 degrees. The highest recorded temperature, which occurred at Gettysburg on August 18, 1959, is 110 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 18 inches. Of this, 14 inches, or 75 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 11 inches. The heaviest 1-day rainfall during the period of record was 4.15 inches at Gettysburg on June 28, 1952. Thunderstorms occur on about 36 days each year, and most occur in summer. Hail falls in scattered small areas during some of these storms.

The average seasonal snowfall is about 31 inches. The greatest snow depth at any one time during the period of record was 29 inches. Blizzards occur several times each winter.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 75 percent of the time possible in summer and 55 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 13 miles per hour, in spring.

Physiography, Relief, and Drainage

Potter County is within the Coteau du Missouri division of the Missouri Plateau (*4*). The Coteau du Missouri consists of gently rolling and hilly end moraines of the Mankato Substage of the Wisconsin Glaciation and nearly level to undulating ground moraines. Much of the material deposited on the ground moraines is silty. A silty loess cap, which is 10 feet thick in places, is on top of the glacial till in the southwestern part of the county. The soils on the breaks along the Missouri River, on the western edge of the county, generally are clayey and formed in glacial till and Pierre Shale.

Artichoke, Little Cheyenne, Okobojo, and Steamboat Creeks are the major drainageways in the county. All of the drainageways are intermittent. They carry water in the spring and after heavy rains. They all drain into Lake Oahe.

Land elevation ranges from about 1,620 feet above sea level along Lake Oahe to about 2,220 feet about 2.5 miles north of Gettysburg.

Settlement

Potter County was named after Dr. Joel A. Potter, an early territorial legislator (*6*). It was established by the Territorial Legislature in 1873. The county was formed from the former Ashmore County and part of Faulk County.

The Sioux were early inhabitants of the area. Evidence of these early inhabitants can be seen by the numerous "tepee rings" on stony ridges throughout the county. The rings were used to hold the sides of the tepees down. The tepees served as temporary homes for hunting parties.

Lewis and Clark explored the area now known as Potter County in 1804. After that, explorers passed through the area as they traveled up the Missouri River. The first permanent settlers in the county were Union veterans of the Civil War. The population increased steadily until 1930, when it reached a peak of 5,762. It declined to 4,396 by 1970 and 3,674 by 1980. Gettysburg, the county seat, is the largest town in the county.

Railroads served the county from the late 1800's until the early 1980's. South Dakota Highways 20, 47, and 1804 and U.S. Highways 83 and 212 are the main transportation routes. Most rural areas are served by all-weather roads, which carry traffic to centers of trade. Small airports are at Gettysburg and Hoven.

Farming

Farming is the principal enterprise in Potter County. About 57 percent of the farm income is derived from the sale of livestock and livestock products (*12*). The rest is derived mainly from the sale of small grain and corn. Some of the crops are used as feed for livestock.

In 1978, 365 farms were in the county. The farms averaged about 1,479 acres in size. The trend is toward fewer and larger farms.

About 62 percent of the acreage in the county is used for cultivated crops or for tame pasture and hay, and about 35 percent is range (*3*). Dryland farming is dominant; however, about 4,000 acres was irrigated in 1981. Nearly all irrigation is by the sprinkler method. The main cropping system is a sequence of row crops, small grain, and summer fallow. Winter wheat, corn, barley, and oats are the main cultivated crops. Alfalfa, intermediate wheatgrass, and smooth bromegrass are the main crops grown for hay. According to the South Dakota Crop and Livestock Reporting Service, corn was grown on 40,000 acres in 1981, wheat on 121,000 acres, oats on 31,000 acres, and barley on 18,000 acres. The corn from 22,400 acres was harvested for grain. The rest was used for silage.

Natural Resources

Soil is the most important natural resource in the county. It provides a growing medium for crops and for the grass grazed by livestock. Other natural resources are water and sand and gravel.

The principal source of water for domestic use and for livestock is shallow wells. Deep wells, drilled to a depth of 1,500 feet, also provide a source of water. Water quantity generally is greater in the deep wells, but the quality is poor because of a high content of soluble salts. Dugouts in areas of Durrstein, Hoven, Regan, Tetonka, and Worthing soils provide additional water for livestock and wildlife. In some areas shallow wells provide water of good quality in sufficient volume for irrigation.

Significant deposits of sand and gravel are in the vicinity of Hoven and Lebanon and along Okobojo Creek. Other scattered small deposits are in various locations throughout the county. These deposits consist mainly of fine to coarse sand and some gravel, silt, and clay. Because of an excessive amount of fine rock fragments, such as shale, chalk, and clay ironstone, the sand and gravel are unsuitable as concrete aggregate or as construction material. They are suitable, however, as subgrade material for roads and as bituminous aggregate.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The nine associations in this county have been grouped for broad interpretive purposes. The associations and the groups are described on the pages that follow. The names of the associations do not coincide exactly with those on the general soil maps in the published surveys of Faulk, Sully, and Walworth Counties, which are adjacent to this county. Differences are the result of variations in the design and composition of map units or changes and refinements in series concepts.

Soil Descriptions

Undulating to Very Steep, Loamy, Clayey, and Stony Soils on Uplands

These soils dominantly are hilly to very steep but are undulating to rolling in some areas. They make up about 17 percent of the county. Most of the acreage is range. Controlling erosion is the main concern of management.

1. Betts-Gettys Association

Well drained, strongly sloping to very steep, loamy and stony soils on uplands

This association generally is on breaks along Lake Oahe. The landscape is characterized by steep slopes and deeply entrenched drainageways. The soils generally are steep and very steep but are strongly sloping on some side slopes. The drainage pattern is well defined. Scattered stones and boulders are on the surface in most areas.

This association makes up about 3 percent of the county. It is about 35 percent Betts soils, 25 percent Gettys soils, and 40 percent minor soils (fig. 2).

The Betts soils are on the upper side slopes and ridges and in rimrock areas. In this association they generally have a slope of 9 to 60 percent. Typically, the surface layer is dark grayish brown, calcareous loam or stony loam. The transitional layer and underlying material are light brownish gray, calcareous clay loam.

The Gettys soils are on the lower side slopes, generally below the Betts soils. Slopes range from 9 to 40 percent. Typically, the surface layer is dark grayish brown clay loam or stony clay loam. The transitional layer and underlying material are grayish brown and olive, calcareous clay loam.

Minor in this association are the dark Java soils, the silty Lowry soils, the shallow, clayey Sansarc soils, and the excessively drained Schamber soils, which are underlain by very gravelly sand. Areas of the Java and Schamber soils are intermingled with areas of the Betts soils. The Lowry soils are on the lower terraces. The Sansarc soils are on the steeper side slopes below the Getty soils.

Nearly all of this association supports native grasses and is used for grazing. Controlling erosion is the main concern of management. This association is suited to range and to rangeland wildlife habitat. It generally is unsuited to cultivated crops and to tame pasture and hay because of the slope and the stoniness.

2. Sansarc Association

Well drained, strongly sloping to steep, clayey soils on uplands

This association is on breaks along Lake Oahe. The landscape is characterized by steep slopes and deeply entrenched drainageways. Slopes generally are moderately steep or steep but are strongly sloping in some areas. The drainage pattern is well defined.

This association makes up about 4 percent of the county. It is about 75 percent Sansarc soils and 25 percent minor soils.

The shallow Sansarc soils are on side slopes and ridges. Slopes range from 9 to 40 percent. Typically, the surface layer is olive gray, calcareous clay. The

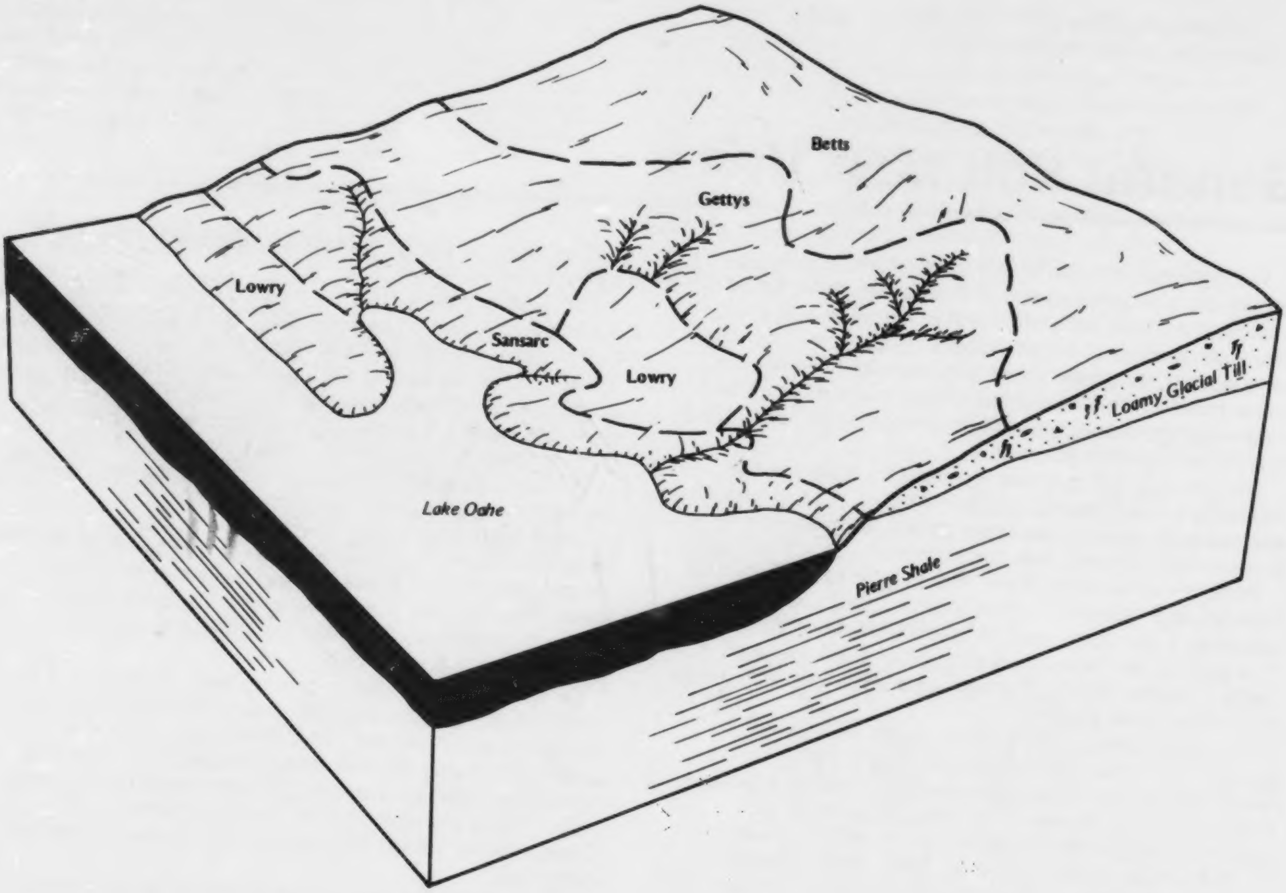

Figure 2.—Pattern of soils and parent material in the Betts-Gettys association.

transitional layer is olive gray, calcareous shaly clay. The underlying material is light olive gray, calcareous shaly clay. Light olive gray, calcareous shale is at a depth of about 15 inches.

Minor in this association are the moderately deep Opal and deep Promise soils in the less sloping areas below the Sansarc soils and Okaton soils on the higher ridges. The Okaton soils are not so dense as the Sansarc soils.

Most of this association supports native grasses and is used for grazing. Controlling erosion and runoff is the main concern of management.

This association is suited to range and to rangeland wildlife habitat. It generally is unsuited to cultivated crops and to tame pasture and hay because of the slope.

3. Java-Betts-Glenham Association

Well drained, undulating to moderately steep, loamy soils on uplands

This association is on glacial moraines characterized by stony ridges and knolls interrupted by narrow swales that terminate in deep depressions. Slopes are short and undulating to moderately steep. The drainage pattern generally is poorly defined. Scattered stones are on the surface in some areas of the Betts and Java soils.

This association makes up about 10 percent of the county. It is about 35 percent Java soils, 30 percent Betts soils, 20 percent Glenham soils, and 15 percent minor soils.

The Java soils are on the upper side slopes and broad ridgetops. Slopes range from 2 to 25 percent. Typically, the surface layer is dark grayish brown loam. The subsoil is dark grayish brown and light brownish gray clay loam. It is calcareous in the lower part. The underlying material is pale yellow and light gray, calcareous clay loam.

The Betts soils are on ridges and knolls. In this association they generally have a slope of 6 to 25 percent. Typically, the surface layer is dark grayish brown, calcareous loam. The transitional layer and underlying material are light brownish gray, calcareous clay loam.

The Glenham soils are on the lower side slopes. In this association they generally have a slope of 2 to 6 percent. Typically, the surface layer is dark grayish brown loam. The subsoil is dark grayish brown, grayish brown, and light brownish gray clay loam. It is calcareous in the lower part. The underlying material is light brownish gray, calcareous clay loam.

Minor in this association are the poorly drained Plankinton and Tetonka and very poorly drained Worthing soils in depressions, the moderately well drained Prosper soils in swales, and the excessively drained Schamber and stony Betts soils on some convex ridges.

Most of this association supports native grasses and is used for grazing. Some of the less sloping areas are used for tame pasture and hay or forage crops. Controlling erosion and runoff is the main concern of management. The stoniness in some areas of the minor soils also is a concern if cultivated crops are grown.

This association is suited to range and to rangeland wildlife habitat. It generally is unsuited to cultivated crops and to tame pasture and hay because of the slope.

Nearly Level to Moderately Sloping, Silty Soils on Uplands

These soils dominantly are nearly level to undulating but in some areas are moderately sloping. They make up about 62 percent of the county. More than 80 percent of the acreage is cropland. Winter wheat, spring wheat, corn, oats, and alfalfa are the main crops. Some areas are irrigated.

4. Agar Association

Well drained, nearly level to undulating, silty soils on uplands

This association dominantly is on an undulating landscape characterized by short slopes. In some areas the slopes are long and smooth. In most areas the drainage pattern is poorly defined, but it is well defined in areas along drainageways.

This association makes up about 17 percent of the county. It is about 60 percent Agar and similar soils and 40 percent minor soils.

The Agar soils have a slope of 0 to 6 percent. Typically, the surface layer is dark gray silt loam. The subsoil is dark grayish brown, grayish brown, and light brownish gray silty clay loam. It is calcareous in the lower part. The underlying material is light brownish gray and light olive gray, calcareous silt loam.

Minor in this association are the poorly drained Hoven and Tetonka soils in depressions, the moderately well drained Mobridge soils in swales, the loamy Peno soils on ridges, and the sodium affected Walke soils on flats.

About 85 percent of this association is cropland. Corn, winter wheat, spring wheat, oats, and alfalfa are the main crops. Some areas are irrigated. Some areas support native grasses and are used for grazing or hay. Conserving moisture is the main concern in managing cultivated areas.

This association is suited to cultivated crops and to tame pasture and hay, range, and openland and rangeland wildlife habitat. It can be irrigated.

5. Highmore Association

Well drained, nearly level to moderately sloping, silty soils on uplands

This association is on uplands characterized by smooth slopes and many swales. The drainage pattern is poorly defined in areas where drainageways terminate in small depressions, but it is well defined along the larger drainageways.

This association makes up about 45 percent of the county. It is about 80 percent Highmore and similar soils and 20 percent minor soils (fig. 3).

The Highmore soils have a slope of 0 to 9 percent. Typically, the surface layer is dark grayish brown silt loam. The subsoil is dark grayish brown, grayish brown, and light olive brown silty clay loam. It is calcareous in the lower part. The underlying material is light yellowish brown, calcareous silt loam. It is mottled in the lower part.

One of the important minor soils in this association is the stony Peno soil, which dominantly is in the north-central part of the county (T. 119 and 120 N., R. 76 W.). Other minor soils are the DeGrey, Eakin, Hoven, Mobridge, Plankinton, Raber, Tetonka, and Walke soils. The moderately well drained DeGrey and Walke soils have a sodium affected subsoil. They occur as areas intermingled with some areas of the Highmore soils. The poorly drained Hoven, Plankinton, and Tetonka soils are in depressions. The moderately well drained Mobridge soils are in swales. The loamy Raber soils are on side slopes along drainageways and on some ridges. Eakin soils are 20 to 40 inches deep over glacial till. They are on side slopes.

About 80 percent of this association is cropland. Corn, winter wheat, spring wheat, oats, and alfalfa are the main crops. Conserving moisture and controlling erosion are the main concerns in managing cultivated areas. The stoniness in some areas of the minor soils also is a concern.

This association is suited to cultivated crops and to tame pasture and hay, range, and openland and rangeland wildlife habitat. It can be irrigated.

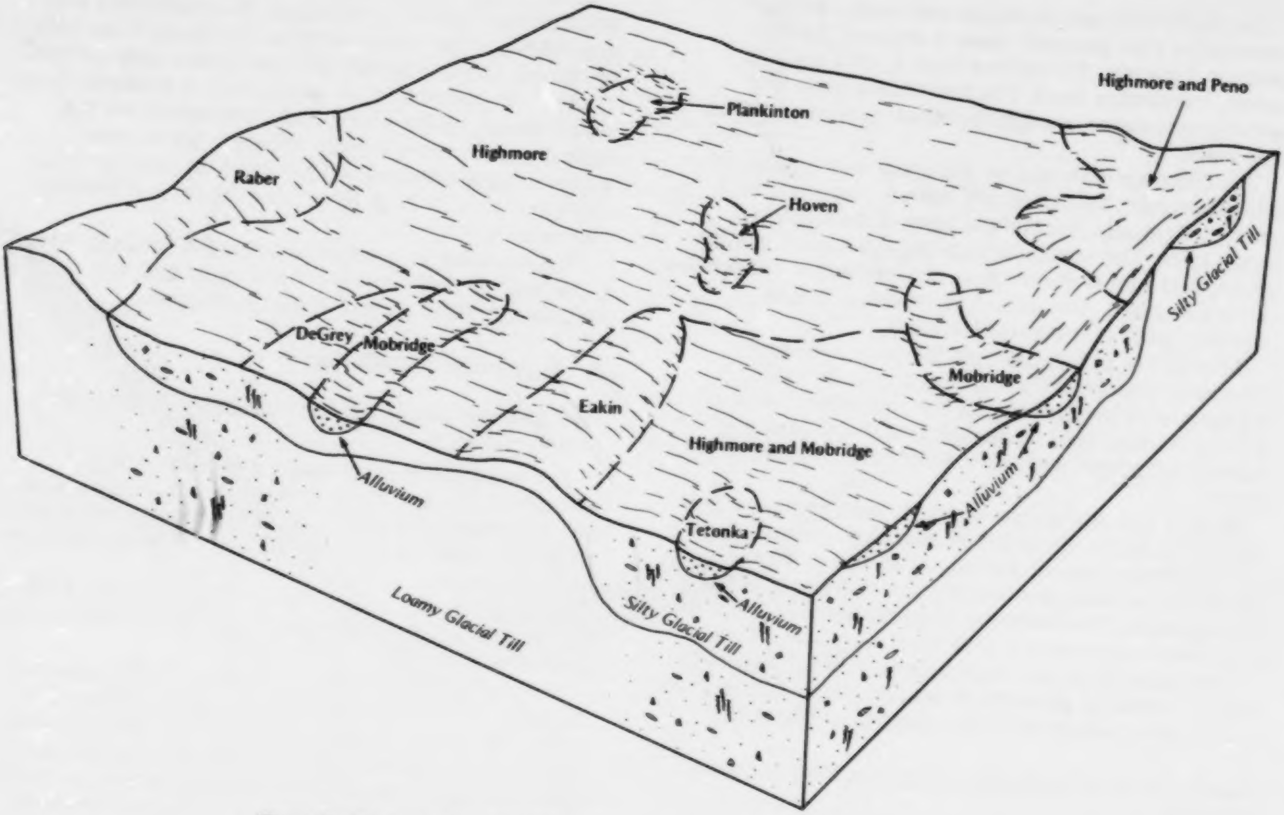

Figure 3.—Pattern of soils and parent material in the Highmore association.

Nearly Level to Hilly, Loamy Soils on Uplands

These soils dominantly are gently undulating to gently rolling but are nearly level to hilly in places. They make up about 12 percent of the county. About 70 percent of the acreage is cropland. Corn, spring wheat, oats, and alfalfa are the main crops. Controlling erosion and improving fertility are the main management concerns.

6. Glenham-Java Association

Well drained, nearly level to hilly, loamy soils on uplands

This association is on a glacial till plain characterized by ridges and knolls interrupted by swales that terminate in depressions. Slopes are nearly level to hilly. They are moderately steep along some drainageways. In most areas the drainage pattern is poorly defined. Scattered stones and boulders are on some of the ridges and knolls.

This association makes up about 11 percent of the county. It is about 60 percent Glenham soils, 20 percent Java soils, and 20 percent minor soils (fig. 4).

The Glenham soils are on the lower side slopes and on broad flats. Slopes range from 0 to 6 percent. Typically, the surface layer is dark grayish brown loam. The subsoil is dark grayish brown, grayish brown, and light brownish gray clay loam. It is calcareous in the lower part. The underlying material is light brownish gray, calcareous clay loam.

The Java soils are on the upper side slopes and on ridges. Slopes range from 2 to 25 percent. Typically, the surface layer is dark grayish brown loam. The subsoil is dark grayish brown and light brownish gray clay loam. It is calcareous in the lower part. The underlying material is pale yellow and light gray, calcareous clay loam.

Minor in this association are the calcareous Betts soils on ridges, the poorly drained Plankinton and Tetonka and very poorly drained Worthing soils in depressions, and the moderately well drained Prosper soils in swales.

About 75 percent of this association is cropland. Corn, spring wheat, oats, and alfalfa are the main crops. Some of the steeper areas support native grasses and are used for grazing or hay. Controlling erosion and improving fertility in areas of the Java soils are the main concerns in managing the major soils for crops. This association is suited to cultivated crops and to tame pasture and hay, range, and openland and rangeland wildlife habitat.

7. Raber-Cavo Association

Well drained, nearly level to gently rolling, loamy soils and moderately well drained, nearly level to gently sloping, sodium affected, loamy soils; on uplands

This association is on uplands characterized by gently undulating to gently rolling areas separated by nearly level flats. The drainage pattern is well defined in most areas.

This association makes up about 1 percent of the county. It is about 60 percent Raber soils, 25 percent Cavo soils, and 15 percent minor soils.

The well drained Raber soils are in convex areas and on side slopes along drainageways. In this association they generally have a slope of 0 to 9 percent. Typically, the surface layer is dark grayish brown loam. The subsoil is grayish brown and light brownish gray clay loam. It is calcareous in the lower part. The underlying material is light brownish gray and pale olive, calcareous clay loam.

The moderately well drained, sodium affected Cavo soils are in concave areas, on flats, and on the lower side slopes. Slopes range from 0 to 6 percent. Typically, the surface layer is gray loam. The subsurface layer is light brownish gray loam. The subsoil is dark grayish brown and light brownish gray clay and clay loam. It is calcareous in the lower part. The underlying material is light brownish gray, calcareous clay loam.

Minor in this association are the silty Eakin soils and the sodium affected Jerauld soils. The Eakin soils are on some ridges above the Raber soils. Areas of the Jerauld soils are intermingled with some areas of the Cavo soils.

Most of this association is range. Scattered areas of the Raber soils are cultivated. Controlling erosion and

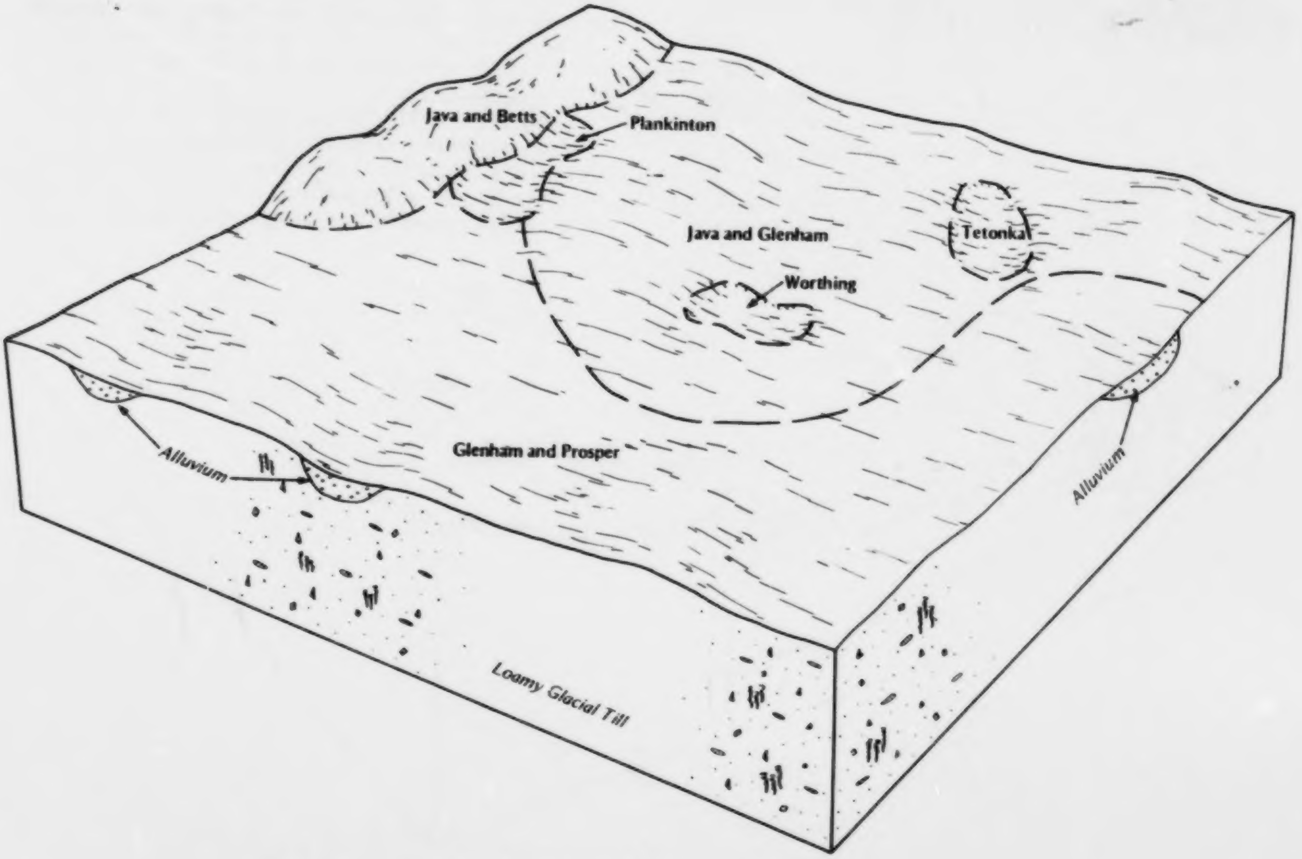

Figure 4.—Pattern of soils and parent material in the Glenham-Java association.

improving tilth are the main management concerns.

This association is suited to range and rangeland wildlife habitat. It is suited to cultivated crops and to tame pasture and hay, but the sodium affected subsoil of the Cavo soils is a limitation.

Nearly Level to Moderately Sloping, Clayey Soils on Uplands

These soils are nearly level to moderately sloping. They make up about 5 percent of the county. About 65 percent of the acreage is cropland. Winter wheat, spring wheat, corn, oats, and alfalfa are the main crops.

8. Promise-Opal Association

Well drained, nearly level to moderately sloping, clayey soils on uplands

This association consists of nearly level to moderately sloping soils on uplands. Areas along drainageways are steeper. The drainage pattern is well defined.

This association makes up about 5 percent of the county. It is about 35 percent Promise soils, 30 percent Opal soils, and 35 percent minor soils.

The Promise soils are on long, smooth or slightly convex slopes. Slopes range from 0 to 6 percent. Typically, the surface layer is dark grayish brown, calcareous clay. The subsoil is dark grayish brown and olive gray, calcareous clay. The underlying material is olive gray, calcareous clay.

The Opal soils are on ridges and short, smooth or slightly convex slopes. In this association they generally have a slope of 2 to 9 percent. Typically, the surface layer is dark gray clay. The subsoil is dark gray and gray clay. It is calcareous in the lower part. The underlying material is gray, calcareous very shaly clay. Below this is gray, soft shale.

Minor in this association are the silty Eakin and Highmore soils on the high parts of the landscape, the poorly drained Hoven soils in depressions, the moderately well drained, sodium affected Hurley soils on the lower side slopes, the loamy Raber soils on some convex ridges, and the shallow Sansarc soils on the steeper side slopes along drainageways.

About 65 percent of this association is cropland. Winter wheat, spring wheat, corn, oats, and alfalfa are the main crops. The steeper areas along drainageways

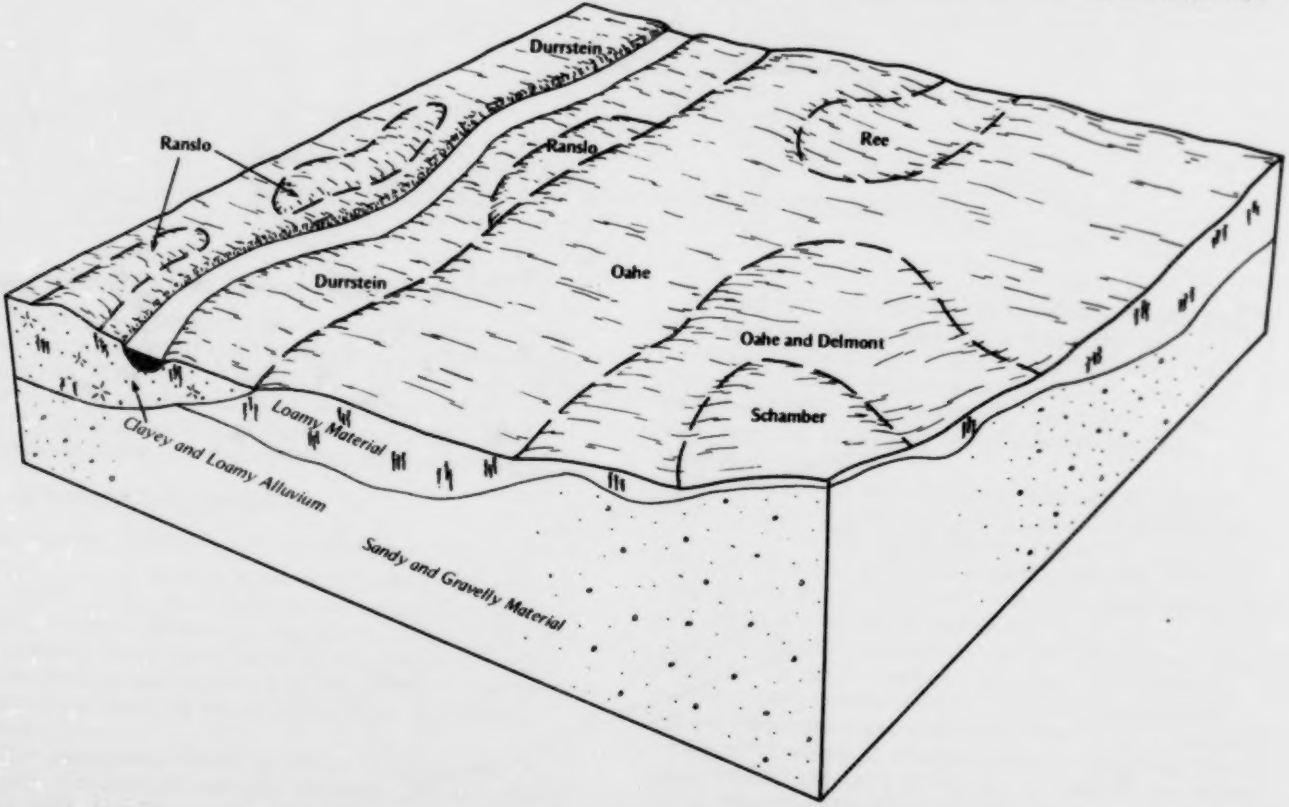

Figure 5.—Pattern of soils and parent material in the Oahe-Durrstein association.

and the sodium affected minor soils support native grasses and are used for grazing and hay. Conserving moisture, improving tilth, and controlling erosion are the main concerns in managing cultivated areas. This association is suited to cultivated crops and to tame pasture and hay, range, and rangeland wildlife habitat.

Nearly Level to Gently Sloping, Loamy and Silty Soils on Outwash Plains, Terraces, and Flood Plains

These soils dominantly are nearly level to gently sloping but are undulating in some areas. They make up about 4 percent of the county. About 60 percent of the acreage is cropland. Winter wheat, spring wheat, corn, oats, and alfalfa are the main crops. Some areas are irrigated.

9. Oahe-Durrstein Association

Well drained, nearly level to gently sloping, loamy soils on outwash plains and terraces and poorly drained, nearly level, sodium affected, silty soils on flood plains

This association consists of nearly level to gently sloping soils on outwash plains and terraces and nearly level soils on flood plains. The drainage pattern is poorly defined.

This association makes up about 4 percent of the county. It is about 55 percent Oahe soils, 25 percent Durrstein soils, and 20 percent minor soils (fig. 5).

The well drained Oahe soils are on outwash plains and terraces characterized by long, smooth slopes. Slopes range from 0 to 6 percent. Typically, the surface layer is dark gray loam. The subsoil is dark grayish brown clay loam. The upper part of the underlying material is light brownish gray, calcareous loam. The lower part is multicolored, calcareous gravelly sand.

The poorly drained Durrstein soils are on smooth or slightly concave slopes on flood plains. Slopes are less than 1 percent. Typically, the surface layer is grayish brown silt loam. The subsoil is dark gray and grayish brown clay. The underlying material is grayish brown and light brownish gray, calcareous clay loam. It is mottled in the lower part.

Minor in this association are Delmont, Ranslo, Ree, Regan, and Schamber soils. The somewhat excessively drained Delmont soils are on convex slopes. The somewhat poorly drained Ranslo soils are on the higher parts of the flood plains. Ree soils are more than 40 inches deep to gravel. They are in positions on the landscape similar to those of the Oahe soils. The very poorly drained Regan soils are in positions on the landscape similar to those of the Durrstein soils. The excessively drained Schamber soils are on ridges and knolls.

About 60 percent of this association is cropland. Corn, spring wheat, oats, and alfalfa are the main crops. Some areas of the Oahe soils are irrigated. Most areas of the Durrstein soils support native grasses and are used for grazing or hay. Conserving moisture is the main concern in managing cultivated areas of the Oahe soils.

The Oahe soils are suited to cultivated crops and to tame pasture and hay, range, and openland and rangeland wildlife habitat. They can be irrigated. The Durrstein soils are suited to range. They generally are unsuited to cultivated crops and to tame pasture and hay. The dense claypan subsoil, the high content of salts in the subsoil, and flooding are limitations.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Agar silt loam, 0 to 2 percent slopes, is one of several phases in the Agar series.

Some map units are made up of two or more major soils. These map units are called soil complexes. A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Lowry-Peno complex, 6 to 9 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

The names of some map units identified on the detailed soil maps do not fully agree with those identified on the maps in the published soil surveys of Faulk, Sully, and Walworth Counties. Differences are the result of variations in the design and composition of map units or changes and refinements in series concepts.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

AgA—Agar silt loam, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on uplands. Areas are irregular in shape and are 5 to 1,500 acres in size. Slopes are long and smooth.

Typically, the surface layer is dark gray silt loam about 5 inches thick. The subsoil is dark grayish brown, grayish brown, and light brownish gray, very friable silty clay loam about 24 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and light olive gray, calcareous silt loam. In places the subsoil contains less clay. In some areas loam or clay loam glacial till is 20 to 40 inches from the surface.

Included with this soil in mapping are small areas of Hoven, Mobridge, and Tetonka soils. These soils make up less than 15 percent of any one mapped area. The poorly drained Hoven and Tetonka soils are in depressions. The moderately well drained Mobridge soils are in swales.

Organic matter content is moderate and fertility medium in the Agar soil. Tilth is good. Permeability is moderate. Available water capacity is high. Runoff is medium. The shrink-swell potential is moderate.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples. The soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama and Kentucky bluegrass.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well.

The capability unit is IIc-2; Silty range site.

AgB—Agar silt loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on uplands. Areas are irregular in shape and are 5 to 800 acres in size. Slopes are long and are smooth or slightly convex.

Typically, the surface layer is dark gray silt loam about 5 inches thick. The subsoil is dark grayish brown, grayish brown, and light brownish gray, very friable silty clay loam about 24 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and light olive gray, calcareous silt loam. In some areas loam or clay loam glacial till is 20 to 40 inches from the surface. In places the subsoil contains less clay.

Included with this soil in mapping are small areas of Hoven, Mobridge, and Tetonka soils. These soils make up less than 10 percent of any one mapped area. The poorly drained Hoven and Tetonka soils are in depressions. The moderately well drained Mobridge soils are in swales.

Organic matter content is moderate and fertility medium in the Agar soil. Tilth is good. Permeability is moderate. Available water capacity is high. Runoff is medium. The shrink-swell potential is moderate.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control erosion and conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples. Contour farming, grassed waterways, and terraces also help to control erosion, but the slopes in some areas are too short or too irregular for contouring and terracing. The soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama or Kentucky bluegrass.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant moisture supply, all climatically suited trees and shrubs grow well. Planting the trees and shrubs on the contour helps to control erosion.

The capability unit is IIe-1; Silty range site.

AmA—Agar-Mobridge silt loams, 0 to 3 percent slopes. These deep, gently undulating soils are on uplands. The well drained Agar soil is on slight rises. The moderately well drained Mobridge soil is in swales. It is occasionally flooded for very brief periods. Areas are irregular in shape and are 5 to about 1,500 acres in size. They are 55 to 70 percent Agar soil and 25 to 35 percent Mobridge soil. The two soils occur as areas so closely intermingled or so small in size that mapping them separately is not practical.

Typically, the surface layer of the Agar soil is dark gray silt loam about 5 inches thick. The subsoil is dark grayish brown, grayish brown, and light brownish gray, very friable silty clay loam about 24 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and light olive gray, calcareous silt loam. In places the subsoil contains less clay. In some areas loam or clay loam glacial till is 20 to 40 inches from the surface.

Typically, the surface soil of the Mobridge soil is dark grayish brown silt loam about 10 inches thick. The subsoil is dark grayish brown and grayish brown, friable silty clay loam about 25 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous silt loam.

Included with these soils in mapping are small areas of the poorly drained Hoven and Tetonka soils in depressions. These included soils make up less than 10 percent of any one mapped area.

Organic matter content is moderate in the Agar soil and high in the Mobridge soil. Fertility is medium in the Agar soil and high in the Mobridge soil. Tilth is good in both soils. Permeability is moderate. Available water capacity is high. Runoff is slow. The shrink-swell potential is moderate.

Most of the acreage is cropland. These soils are suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples. Farming is delayed in some years when the Mobridge soil receives runoff from adjacent uplands, but in most years the additional moisture is beneficial. These soils are suited to irrigation.

These soils are suited to range. The native vegetation on the Agar soil dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. That on the Mobridge soil dominantly is big bluestem and lesser amounts of green needlegrass and western wheatgrass. Overused areas of the Agar soil are dominated by blue grama and Kentucky bluegrass. Overused areas of the Mobridge soil are dominated by western wheatgrass and Kentucky bluegrass.

These soils are suited to windbreaks and environmental plantings. All climatically suited trees and shrubs grow well. Those that require an abundant moisture supply grow especially well in areas of the Mobridge soil.

The Agar soil is in capability unit IIc-2, Silty range site; the Mobridge soil is in capability unit IIc-3, Overflow range site.

AoA—Agar-Mobridge-Tetonka silt loams, 0 to 3 percent slopes. These deep, level to gently undulating soils are on uplands. The well drained Agar soil is on slight rises. The moderately well drained Mobridge soil is in swales. It is occasionally flooded for very brief periods. The poorly drained Tetonka soil is in depressions. It is ponded during periods of snowmelt and heavy rainfall. Areas are irregular in shape and are 25 to 2,400 acres in size. They are 55 to 65 percent Agar soil, 15 to 20 percent Mobridge soil, and 10 to 15 percent Tetonka soil. The three soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Agar soil is dark gray silt loam about 5 inches thick. The subsoil is dark grayish brown, grayish brown, and light brownish gray, very friable silty clay loam about 24 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and light olive gray, calcareous silt loam. In places the subsoil contains less clay. In some areas loam or clay loam glacial till is 20 to 40 inches from the surface.

Typically, the surface and subsurface layers of the Mobridge soil are dark grayish brown silt loam about 10 inches thick. The subsoil is dark grayish brown and grayish brown, friable silty clay loam about 25 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous silt loam.

Typically, the surface layer of the Tetonka soil is dark gray silt loam about 7 inches thick. The subsurface layer is light gray and gray silt loam about 7 inches thick. The subsoil is about 33 inches thick. It is dark gray, firm silty clay loam in the upper part and grayish brown, firm clay in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam.

Included with these soils in mapping are small areas of Hoven and Plankinton soils. These included soils make up less than 5 percent of any one mapped area. They have a surface layer that is less than 6 inches thick. They are in positions on the landscape similar to those of the Tetonka soil.

Organic matter content is moderate in the Agar and Tetonka soils and high in the Mobridge soil. Fertility is medium in the Agar and Tetonka soils and high in the Mobridge soil. Tilth is good in all three soils. Permeability is moderate in the Agar and Mobridge soils. It is very slow in the Tetonka soil. Available water capacity is high in all three soils. A seasonal high water table is within a depth of 1 foot in the Tetonka soil. As much as 1 foot of water ponds on the surface of this soil during some wet periods. Runoff is slow on the Agar and Mobridge soils and ponded on the Tetonka soil. The shrink-swell potential is moderate in the Agar and Mobridge soils and high in the Tetonka soil.

Most of the acreage is cropland. These soils are suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Garrison creeping foxtail and reed canarygrass are suited to the Tetonka soil. Measures that conserve moisture are the main management needs in cultivated areas. Measures that control the ponding on the Tetonka soil also are needed. Minimizing tillage, including grasses and legumes in the cropping sequence, and leaving crop residue on the surface conserve moisture. Farming is delayed in some years when the Mobridge and Tetonka soils receive runoff from the adjacent uplands. Surface drains help to control the excess water in areas of the Tetonka soil.

These soils are suited to native grasses, but very few areas are used for range. The native vegetation dominantly is western wheatgrass, green needlegrass, and needleandthread on the Agar soil, big bluestem and green needlegrass on the Mobridge soil, and sedges, prairie cordgrass, and reedgrasses on the Tetonka soil Overused areas of the Agar soil are dominated by blue grama and Kentucky bluegrass. Overused areas of the Mobridge soil are dominated by western wheatgrass and Kentucky bluegrass. Overused areas of the Tetonka soil are dominated by foxtail barley, sedges, and weeds. Many areas of this soil are potential sites for excavated ponds.

The Agar and Mobridge soils are suited to windbreaks and environmental plantings. All climatically suited trees and shrubs grow well on the Agar and Mobridge soils, but optimum growth and survival are unlikely on the Tetonka soil unless it is drained. The trees and shrubs that require an abundant supply of moisture grow especially well on the Mobridge soil.

The Agar soil is in capability unit IIc-2, Silty range site; the Mobridge soil is in capability unit IIc-3, Overflow range site; the Tetonka soil is in capability unit IVw-1, Wet Meadow range site.

BgE—Betts-Gettys complex, stony, 15 to 60 percent slopes. These deep, well drained, moderately steep to very steep, stony soils are on the breaks along Lake Oahe. The Betts soil is on the upper slopes. The

Gettys soil is on the lower slopes. Scattered stones and boulders occupy 3 to 15 percent of the surface. Areas are irregular in shape and are 5 to 2,200 acres in size. They are 45 to 55 percent Betts soil and 25 to 35 percent Gettys soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Betts soil is dark grayish brown, calcareous stony loam about 4 inches thick. The transitional layer is about 4 inches of light brownish gray, calcareous clay loam. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam. Rock fragments make up 5 to 25 percent of the transitional layer and underlying material. In some areas the soil contains more silt throughout.

Typically, the surface layer of the Gettys soil is dark grayish brown stony clay loam about 3 inches thick. The transitional layer is about 5 inches of grayish brown, calcareous clay loam. The underlying material to a depth of 60 inches is grayish brown and olive, calcareous clay loam. Rock fragments make up 5 to 25 percent of the transitional layer and underlying material.

Included with these soils in mapping are small areas of Lowry, Opal, Sansarc, and Schamber soils. These included soils make up less than 20 percent of any one mapped area. The silty Lowry soils are on small flats below the Gettys soil. The clayey Opal soils are 20 to 40 inches deep to shale. They are on convex slopes below the Gettys soil. The excessively drained Schamber soils are underlain by gravelly material. They are on some high ridges. Sansarc soils are 6 to 20 inches deep to shale. They are on the steeper slopes below the Gettys soil.

Organic matter content and fertility are low in the Betts and Gettys soils. Permeability is moderate in the upper part of the Betts soil and moderately slow in the underlying material. It is moderately slow in the Gettys soil. Available water capacity is high in both soils. Runoff is rapid. The shrink-swell potential is moderate in the Betts soil and high in the Gettys soil.

All of the acreage supports native grasses. These soils are suited to range, but productivity is limited by the numerous stones and boulders. The native vegetation dominantly is little bluestem and sideoats grama and lesser amounts of western wheatgrass and needleandthread. Overused areas are dominated by sideoats grama and blue grama.

These soils are generally unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings because of the slope and the stoniness.

The capability unit is VIIs-6; Thin Upland range site.

BkE—Betts-Java loams, 9 to 25 percent slopes. These deep, well drained, rolling and hilly soils are on uplands. Scattered stones and boulders are on the surface in most areas. The Betts soil is on ridges and the upper side slopes. The Java soil is on the lower side slopes. Areas are irregular in shape and are 5 to 500 acres in size. They are 45 to 65 percent Betts soil and 25 to 40 percent Java soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Betts soil is dark grayish brown, calcareous loam about 4 inches thick. The transitional layer is about 4 inches of light brownish gray, calcareous clay loam. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam. In places the subsoil contains more clay.

Typically, the surface layer of the Java soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown and light brownish gray, very friable clay loam about 12 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is pale yellow and light gray, calcareous clay loam. In places free carbonates are leached below a depth of 10 inches.

Included with this soil in mapping are small areas of Plankinton, Prosper, Tetonka, and Worthing soils. These included soils make up less than 15 percent of any one mapped area. The poorly drained Plankinton and Tetonka soils and the very poorly drained Worthing soils are in depressions. The moderately well drained Prosper soils are in swales. Also included are areas of the very stony Betts soils on ridges. These areas range from 1 to 4 acres in size.

Organic matter content and fertility are low in the Betts and Java soils. Permeability is moderate in the upper part of these soils and moderately slow in the underlying glacial till. Available water capacity is high. Runoff is very rapid. The shrink-swell potential is moderate.

Most of the acreage supports native grasses. These soils are suited to range. The native vegetation on the Betts soil dominantly is little bluestem and lesser amounts of sideoats grama, blue grama, western wheatgrass, and needleandthread. That on the Java soil dominantly is western wheatgrass and green needlegrass and lesser amounts of little bluestem, needleandthread, and sideoats grama. Overused areas of both soils are dominated by blue grama and threadleaf sedge.

These soils generally are too steep for cultivated crops, tame pasture and hay, and windbreaks and environmental plantings.

The capability unit is VIe-3; the Betts soil is in the Thin Upland range site, the Java soil in the Silty range site.

Bo—Bon loam. This deep, moderately well drained, nearly level soil is on stream terraces and flood plains. It is occasionally flooded. Areas are long and narrow and are 5 to 100 acres in size. Slopes are long and smooth.

Typically, the surface layer is dark gray loam about 8 inches thick. The subsurface layer is dark gray, friable loam about 15 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is dark gray, grayish brown, gray, and light brownish gray, calcareous, stratified clay loam and loam.

Included with this soil in mapping are small areas of Durrstein and Mobridge soils. These soils make up less than 15 percent of any one mapped area. The poorly drained Durrstein soils have a sodium affected subsoil. They are slightly lower on the landscape than the Bon soil. Mobridge soils are not stratified. They are in upland swales.

Organic matter content and fertility are high in the Bon soil. Tilth is good. Permeability is moderate. Available water capacity is high. Runoff is slow.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is big bluestem and western wheatgrass and lesser amounts of green needlegrass. Overused areas are dominated by western wheatgrass and Kentucky bluegrass.

This soil is suited to cultivated crops and to tame pasture and hay. Because the soil occurs as long, narrow areas, it generally is farmed with the adjacent soils. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples. Floodwater delays planting in some years, but in most years the additional moisture is beneficial and the flood damage is minor. This soil is suited to irrigation.

This soil is suited to windbreaks and environmental plantings. The trees and shrubs that require an abundant supply of moisture grow especially well.

The capability unit is IIc-3; Overflow range site.

Bv—Bon loam, channeled. This deep, moderately well drained, nearly level soil is on flood plains that are dissected into many small tracts by narrow channels and partly filled old stream meanders. It is frequently flooded. Areas are long and narrow and are 5 to 450 acres in size.

Typically, the surface layer is dark gray loam about 8 inches thick. The subsurface layer is dark gray, friable loam about 15 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is dark gray, grayish brown, gray, and light brownish gray, calcareous, stratified clay loam and loam.

Included with this soil in mapping are small areas of Durrstein and Mobridge soils. These soils make up less than 15 percent of any one mapped area. The poorly drained Durrstein soils have a sodium affected subsoil. They are slightly lower on the landscape than the Bon soil. Mobridge soils are not stratified. They are in upland swales.

Organic matter content and fertility are high in the Bon soil. Tilth is good. Permeability is moderate. Available water capacity is high. A seasonal high water table is at a depth of 2 to 6 feet in the spring of most years. Runoff is slow.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is big bluestem and western wheatgrass and lesser amounts of green needlegrass. Overused areas are dominated by western wheatgrass and Kentucky bluegrass.

This soil generally is unsuited to cultivated crops because it is dissected into small tracts and is subject to flooding in the spring. It is suited to windbreaks and environmental plantings and to tame pasture and hay. The trees and shrubs that require an abundant supply of moisture grow especially well. They can be planted by hand. Because of the meandering stream channels, however, they generally cannot be planted by machine. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass.

The capability unit is VIw-1; Overflow range site.

CaA—Cavo loam, 0 to 2 percent slopes. This deep, moderately well drained, nearly level soil is on uplands. Areas are irregular in shape and are 5 to 300 acres in size. Slopes are slightly concave.

Typically, the surface layer is gray loam about 4 inches thick. The subsurface layer is light brownish gray loam about 4 inches thick. The subsoil is about 14 inches thick. It is dark grayish brown and light brownish gray, firm clay and clay loam. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam. In places the subsoil does not have columnar structure.

Included with this soil in mapping are small areas of Glenham, Jerauld, and Raber soils. These soils make up less than 20 percent of any one mapped area. The well drained Glenham and Raber soils are on slight rises. They do not have a sodium affected subsoil. Jerauld soils are in small pits and depressions. They have visible salts within a depth of 16 inches.

Organic matter content is moderate and fertility medium in the Cavo soil. Tilth is poor. The soil has a sodium affected subsoil that restricts root penetration. Permeability is very slow in the subsoil and moderately slow in the underlying material. Available water capacity is moderate. Runoff is slow. The shrink-swell potential is high.

Most of the acreage supports native grasses. This soil is suited to range, but the dense claypan subsoil limits productivity. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of blue grama. Overused areas are dominated by blue grama and buffalograss.

This soil is suited to cultivated crops. It is droughty late in the growing season because of the sodium affected subsoil, which restricts root development. The best suited crops are those that are tolerant of drought and sodium salts. Early maturing small grain is better suited than corn. The main concerns of management are improving tilth, increasing the rate of water intake, and conserving moisture. Subsoiling helps to break up the dense claypan subsoil and increases the rate of water intake for a short time. Leaving crop residue on the surface, including grasses and legumes in the cropping sequence, and applying animal manure conserve moisture and improve tilth.

This soil is suited to tame pasture and hay. The only suitable species are those that can grow in a soil that has a claypan subsoil and contains sodium salts. Alfalfa, crested wheatgrass, intermediate wheatgrass, pubescent wheatgrass, and western wheatgrass are examples.

This soil is suited to windbreaks and environmental plantings, but the sodium affected subsoil is a limitation. Optimum growth, survival, and vigor are unlikely.

The capability unit is IVs-2; Claypan range site.

Da—Davison loam. This deep, moderately well drained, nearly level soil is in swales in the uplands. Areas are irregular in shape and are 5 to 150 acres in size. Slopes generally are smooth or slightly concave.

Typically, the surface layer is very dark gray loam about 6 inches thick. The subsurface layer is gray loam about 6 inches thick. The subsoil is light gray, firm, calcareous loam about 18 inches thick. The underlying material to a depth of 60 inches is light gray, calcareous loam. In places gravelly material is 20 to 40 inches from the surface. In some areas a water table is within a depth of 1 foot.

Included with this soil in mapping are small areas of Oahe and Ranslo soils. These soils make up less than 10 percent of any one mapped area. The well drained Oahe soils have a lower content of free carbonates throughout than the Davison soil and are 20 to 40 inches deep to gravelly material. The somewhat poorly drained Ranslo soils have a sodium affected subsoil. All of the included soils are in positions on the landscape similar to those of the Davison soil.

Organic matter content is moderate and fertility medium in the Davison soil. Tilth is good. The high content of lime adversely affects the growth of most crops. Permeability is moderate. Available water capacity also is moderate. A seasonal high water table is at a depth of 2 to 4 feet in the spring of most years. Runoff is slow. The shrink-swell potential is moderate.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay; however, the high content of lime adversely affects the availability of plant nutrients. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control wind erosion and improve fertility are the main management needs in cultivated areas. Examples are leaving crop residue on the surface, minimizing tillage, and including grasses and legumes in the cropping sequence. This soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is little bluestem and lesser amounts of big bluestem, green needlegrass, and western wheatgrass. Overused areas are dominated by western wheatgrass, bluegrass, and saltgrass.

This soil is suited to windbreaks and environmental plantings. All climatically suited trees and shrubs grow well.

The capability unit is IIe-4; Limy Subirrigated range site.

De—DeGrey silt loam. This deep, moderately well drained, nearly level soil is on uplands. Areas are irregular in shape and are 5 to 250 acres in size. Slopes are smooth or slightly concave.

Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The subsurface layer is light brownish gray silt loam about 2 inches thick. The subsoil is dark grayish brown and grayish brown, very firm and firm silty clay about 21 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is grayish brown, calcareous silty clay loam and loam. In places the subsoil does not have columnar structure.

Included with this soil in mapping are small areas of Highmore, Hoven, Jerauld, and Mobridge soils. These soils make up less than 15 percent of any one mapped area. Highmore and Mobridge soils do not have a sodium affected subsoil. Highmore soils are on slight rises, and Mobridge soils are in swales. The poorly drained Hoven soils are in depressions. Jerauld soils have visible salts within a depth of 16 inches. They are in slight depressions.

Organic matter content is moderate and fertility medium in the DeGrey soil. Tilth is poor. The soil has a sodium affected subsoil that restricts root penetration. Permeability is very slow in the subsoil and moderately slow in the underlying material. Available water capacity is moderate. Runoff is slow. The shrink-swell potential is high.

Most of the acreage supports native grasses. The soil is suited to range, but the dense, compact subsoil limits productivity. The native vegetation dominantly is western wheatgrass and lesser amounts of green needlegrass and blue grama. Overused areas are dominated by blue grama and buffalograss.

This soil is suited to cultivated crops. It is droughty late in the growing season because of the sodium affected subsoil, which restricts root development. The best suited crops are those that are tolerant of drought and sodium salts. Early maturing small grain is better suited than corn. Measures that improve tilth, increase the rate of water intake, and conserve moisture are the main management needs. Subsoiling helps to break up the dense claypan subsoil and increases the rate of water intake for a short time. Leaving crop residue on the surface, including grasses and legumes in the cropping sequence, and applying animal manure conserve moisture and improve tilth.

This soil is suited to tame pasture and hay. The only suitable species are those that can grow in a soil that has a claypan subsoil and contains sodium salts. Alfalfa, crested wheatgrass, intermediate wheatgrass, pubescent wheatgrass, and western wheatgrass are examples.

This soil is suited to windbreaks and environmental plantings, but the sodium affected subsoil is a limitation. Optimum growth, survival, and vigor are unlikely.

The capability unit is IVs-2; Claypan range site.

DmA—Delmont loam, 0 to 2 percent slopes. This somewhat excessively drained, nearly level soil is on outwash plains and terraces. It is shallow over gravelly material. Areas are irregular in shape and are 5 to 150 acres in size. Slopes are smooth or slightly convex.

Typically, the surface layer is dark grayish brown loam about 4 inches thick. The subsoil is grayish brown, very friable loam about 12 inches thick. The underlying material to a depth of 60 inches is multicolored, calcareous gravelly loamy sand. In places the depth to gravelly material is more than 20 inches.

Included with this soil in mapping are small areas of the excessively drained Schamber soils on short, steep slopes. These soils make up less than 10 percent of any one mapped area. They are less than 10 inches deep to very gravelly sand.

Organic matter content is moderate and fertility medium in the Delmont soil. Tilth is good. The soil is droughty because the rooting depth is limited by the gravelly underlying material. Permeability is moderate in the subsoil and rapid in the underlying material. Available water capacity is low. Runoff is slow.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay, but it is droughty. The choice of pasture plants is limited to drought-resistant species, such as alfalfa, crested wheatgrass, and pubescent wheatgrass. Measures that conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples.

This soil is suited to range. The native vegetation dominantly is needleandthread and lesser amounts of blue grama, little bluestem, and threadleaf sedge. Overused areas are dominated by threadleaf sedge and blue grama.

This soil is suited to windbreaks and environmental plantings; however, it is droughty. Trees and shrubs can be established, but optimum survival, growth, and vigor are unlikely.

The capability unit is IVs-1; Shallow to Gravel range site.

DsD—Delmont-Schamber complex, 6 to 15 percent slopes. These moderately sloping and strongly sloping soils are on uplands. In some areas scattered stones are on the surface. The somewhat excessively drained Delmont soil is on the lower and middle side slopes. It is shallow over gravel. The excessively drained Schamber soil is on the upper side slopes and on ridges. It is very shallow over gravel. Areas are long and narrow or irregular in shape and are 5 to 25 acres in size. They are 50 to 60 percent Delmont soil and 25 to 35 percent Schamber soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Delmont soil is dark grayish brown loam about 4 inches thick. The subsoil is grayish brown, very friable loam about 12 inches thick. The underlying material to a depth of 60 inches is multicolored, calcareous gravelly loamy sand. In places the depth to gravelly material is more than 20 inches.

Typically, the surface layer of the Schamber soil is dark grayish brown gravelly loam about 4 inches thick. The underlying material to a depth of 60 inches is multicolored, calcareous very gravelly sand.

Included with these soils in mapping are small areas of the well drained Betts, Glenham, and Java soils. These included soils make up less than 15 percent of any one mapped area. They are not underlain by gravelly material. Betts and Java soils are on ridges and the upper side slopes. Glenham soils are on the lower side slopes and foot slopes.

Organic matter content is moderate and fertility medium in the Delmont soil. Organic matter content and fertility are low in the Schamber soil. Permeability is moderate in the upper part of the Delmont soil and rapid in the underlying material. It is rapid in the Schamber soil. Available water capacity is low in both soils. Runoff is slow.

Most of the acreage supports native grasses. These soils are suited to range. The native vegetation dominantly is needleandthread and blue grama and lesser amounts of threadleaf sedge and sideoats grama. Overused areas are dominated by blue grama and threadleaf sedge interspersed with bare spots.

These soils generally are unsuited to cultivated crops and windbreaks and environmental plantings. Droughtiness severely limits the choice of plants and productivity. The Delmont soil is suited to tame pasture and hay; however, productivity is limited because of the droughtiness. Alfalfa and pubescent wheatgrass are suitable species.

The Delmont soil is in capability unit VIe-5, Shallow to Gravel range site; the Schamber soil is in capability unit VIs-4, Very Shallow range site.

Du—Durrstein silt loam. This deep, poorly drained, nearly level soil is on flood plains. It is occasionally flooded. Areas are irregular in shape or long and narrow and are 5 to 650 acres in size. Slopes generally are smooth or slightly concave, but in places they are slightly convex.

Typically, the surface layer is grayish brown silt loam about 2 inches thick. The subsoil is dark gray and grayish brown, firm clay about 13 inches thick. The underlying material to a depth of 60 inches is grayish brown and light brownish gray, calcareous clay loam. It is mottled in the lower part.

Included with this soil in mapping are small areas of the somewhat poorly drained Ranslo soils and the very poorly drained Regan soils. These soils make up less than 15 percent of any one mapped area. Ranslo soils have a surface layer that is more than 5 inches thick and do not have visible salts within a depth of 15 inches. They are slightly higher on the landscape than the Durrstein soil. Regan soils do not have a natric horizon. They are in positions on the landscape similar to those of the Durrstein soil. Also included is a soil that does not have a sodium affected subsoil and has accumulations of salts on the surface.

Organic matter content and fertility are low in the Durrstein soil. Tilth is poor. The soil has a sodium affected subsoil that restricts root penetration. Permeability is very slow. Available water capacity is moderate. A seasonal high water table is within a depth of 1.5 feet during wet periods. Runoff is slow. The shrink-swell potential is high.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is western wheatgrass, Nuttall alkaligrass, and saltgrass. Overused areas are dominated by saltgrass and weeds interspersed with bare spots.

This soil generally is unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings. The dense claypan subsoil and the high content of salts in the subsoil are limitations.

The capability unit is VIw-4; Saline Lowland range site.

EaA—Eakin silt loam, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on uplands. Areas are irregular in shape and are 5 to 650 acres in size. Slopes are smooth or slightly convex.

Typically, the surface layer is dark gray silt loam about 7 inches thick. The subsoil is about 23 inches thick. It is dark grayish brown and grayish brown, friable silty clay loam over light yellowish brown, very friable, calcareous silt loam. The underlying material to a depth of 60 inches is grayish brown and light yellowish brown, calcareous clay loam. In some areas the underlying material is silt loam. In places, the surface layer is not so dark and the soil is calcareous at or near the surface.

Included with this soil in mapping are small areas of Cavo, Mobridge, and Raber soils. These soils make up less than 15 percent of any one mapped area. The moderately well drained Cavo soils are in low areas. They have a sodium affected subsoil. The moderately well drained Mobridge soils are in swales. Raber soils contain more sand and clay in the subsoil than the Eakin soil. They are in positions on the landscape similar to those of the Eakin soil.

Organic matter content is moderate and fertility medium in the Eakin soil. Tilth is good. Permeability is moderate in the subsoil and moderately slow in the underlying glacial till. Available water capacity is high. Runoff is slow. The shrink-swell potential is moderate.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples. This soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama or Kentucky bluegrass.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well.

The capability unit is IIc-2; Silty range site.

EpB—Eakin-Peno complex, 2 to 6 percent slopes. These deep, well drained, gently sloping soils are on uplands. The Eakin soil is on side slopes. The Peno soil is in the higher convex areas, where scattered stones generally are on the surface. Areas are irregular in shape and are 5 to 225 acres in size. They are about 55 to 80 percent Eakin soil and 15 to 35 percent Peno soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Eakin soil is dark gray silt loam about 7 inches thick. The subsoil is about 23 inches thick. It is dark grayish brown and grayish brown, friable silty clay loam over light yellowish brown, very friable, calcareous silt loam. The underlying material to a depth of 60 inches is grayish brown and light yellowish brown, calcareous clay loam. In some areas the underlying material is silt loam. In places, the surface layer is not so dark and the soil is calcareous at or near the surface.

Typically, the surface layer of the Peno soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown and grayish brown, firm clay loam about 11 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and grayish brown, calcareous clay loam. In places free carbonates are leached to a depth of 12 inches or more.

Included with these soils in mapping are small areas of the moderately well drained Cavo and Mobridge soils. These included soils make up less than 15 percent of any one mapped area. Cavo soils have a sodium affected subsoil. They are in small depressions. Mobridge soils are in swales.

Organic matter content is moderate and fertility medium in the Eakin and Peno soils. Tilth is good in the Eakin soil. It is fair in the Peno soil. Permeability is moderate in the subsoil of the Eakin soil and moderately slow in the underlying glacial till. It is moderately slow in the Peno soil. Available water capacity is high in both soils. Runoff is medium. The shrink-swell potential is moderate in the Eakin soil and high in the Peno soil.

Most of the acreage is cropland. These soils are suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control erosion and conserve moisture are the main management needs. Leaving crop residue on the surface and minimizing tillage are examples. Contour farming, grassed waterways, and terraces also help to control erosion, but the slopes in some areas are too short or too irregular for contouring and terracing. In some areas of the Peno soil, the surface stones hinder the use of farm machinery. They should be removed annually.

These soils are suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama, buffalograss, and Kentucky bluegrass.

These soils are suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, most climatically suited trees and shrubs grow well. Planting the trees and shrubs on the contour helps to control erosion.

The Eakin soil is in capability unit IIe-1, Silty range site; the Peno soil is in capability unit IIIe-3, Clayey range site.

EpC—Eakin-Peno complex, 6 to 9 percent slopes. These deep, well drained, moderately sloping soils are on uplands. The Eakin soil is on side slopes. The Peno soil is in the higher convex areas, where scattered stones generally are on the surface. Areas are irregular in shape and are 5 to 200 acres in size. They are 55 to 65 percent Eakin soil and 25 to 35 percent Peno soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Eakin soil is dark gray silt loam about 7 inches thick. The subsoil is about 23 inches thick. It is dark grayish brown and grayish brown, friable silty clay loam over light yellowish brown, very friable, calcareous silt loam. The underlying material to a depth of 60 inches is grayish brown and light yellowish brown, calcareous clay loam. In some areas the underlying material is silt loam. In places, the surface layer is not so dark and the soil is calcareous at or near the surface.

Typically, the surface layer of the Peno soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown and grayish brown, firm clay loam about 11 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and grayish brown, calcareous clay loam. In places free carbonates are leached to a depth of 12 inches or more.

Included with these soils in mapping are small areas of the stony Gettys soils on some of the more convex parts of the landscape. These included soils make up less than 15 percent of any one mapped area. They have free carbonates at or near the surface.

Organic matter content is moderate and fertility medium in the Eakin and Peno soils. Tilth is good in the Eakin soil. It is fair in the Peno soil. Permeability is moderate in the subsoil of the Eakin soil and moderately slow in the underlying glacial till. It is moderately slow in the Peno soil. Available water capacity is high in both soils. Runoff is medium. The shrink-swell potential is moderate in the Eakin soil and high in the Peno soil.

Most of the acreage is cropland. These soils are suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control erosion and conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples. Contour farming, grassed waterways, and terraces also help to control erosion, but the slopes in some areas are too short or too irregular for contouring and terracing. In some areas of the Peno soil, the surface stones hinder the use of farm machinery. They should be removed annually.

These soils are suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama, buffalograss, and Kentucky bluegrass.

These soils are suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, most climatically suited trees and shrubs grow well. Planting the trees and shrubs on the contour helps to control erosion.

The Eakin soil is in capability unit IIIe-1, Silty range site; the Peno soil is in capability unit IVe-3, Clayey range site.

GeF—Gettys clay loam, 25 to 40 percent slopes. This deep, well drained, steep soil is on ridges and side slopes along drainageways in the uplands. Scattered glacial stones and boulders are on the surface and throughout the soil. Areas are irregular in shape and are 5 to 400 acres in size. Slopes are short and are smooth or convex.

Typically, the surface layer is dark grayish brown clay loam about 3 inches thick. The transitional layer is about 5 inches of grayish brown, calcareous clay loam. The underlying material to a depth of 60 inches is grayish brown and olive, calcareous clay loam. In some areas the soil contains less clay.

Included with this soil in mapping are small areas of Peno, Raber, Sansarc, and Schamber soils. These soils make up less than 15 percent of any one mapped area. Peno and Raber soils have a surface layer that is thicker than that of the Gettys soil. Also, they are less sloping. Sansarc soils are 6 to 20 inches deep to shale. They are on the steeper slopes below the Gettys soil. The excessively drained Schamber soils are less than 10 inches deep to very gravelly sand. They are on ridges and knolls.

Organic matter content and fertility are low in the Gettys soil. Permeability is moderately slow. Available water capacity is high. Runoff is very rapid. The shrink-swell potential is high.

All of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is little bluestem and lesser amounts of sideoats grama, western wheatgrass, and threadleaf sedge. Overused areas are dominated by threadleaf sedge and sideoats grama interspersed with bare spots. Many areas in the deeper drainageways are suitable sites for stock water impoundments.

This soil is generally unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings because of the steep slopes.

The capability unit is VIIe-3; Thin Upland range site.

GlA—Glenham loam, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on uplands. Areas are irregular in shape and are 5 to 200 acres in size.

Typically, the surface layer is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown, grayish brown, and light brownish gray, friable clay loam about 24 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam. In places the soil is calcareous within a depth of 10 inches.

Included with this soil in mapping are small areas of Plankinton and Prosper soils. These soils make up less than 10 percent of any one mapped area. The poorly drained Plankinton soils are in depressions. The moderately well drained Prosper soils are in swales.

Organic matter content is moderate and fertility medium in the Glenham soil. Tilth is good. Permeability is moderate in the upper part of the soil and moderately slow in the underlying material. Available water capacity is high. Runoff is slow. The shrink-swell potential is moderate.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples. This soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is green needlegrass and western wheatgrass and lesser amounts of needleandthread. Overused areas are dominated by blue grama and Kentucky bluegrass.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well.

The capability unit is IIc-2; Silty range site.

GpB—Glenham-Plankinton complex, 0 to 4 percent slopes. These deep, level to undulating soils are on uplands. The well drained Glenham soil is on slight rises. The poorly drained Plankinton soil is in depressions. Areas are long and narrow or irregular in shape and are 5 to 700 acres in size. They are 55 to 65 percent Glenham soil and 20 to 35 percent Plankinton soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Glenham soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown, grayish brown, and light brownish gray, friable clay loam about 24 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam. In places the soil is calcareous within a depth of 10 inches.

Typically, the surface layer of the Plankinton soil is dark gray silt loam about 4 inches thick. The subsurface layer is gray silt loam about 3 inches thick. The subsoil is about 32 inches thick. It is dark gray, firm clay and clay loam. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam. In places the soil has a sodium affected subsoil and a thinner surface layer.

Included with these soils in mapping are small areas of Prosper and Tetonka soils. These included soils make up less than 15 percent of any one mapped area. The moderately well drained Prosper soils are in swales. The poorly drained Tetonka soils are in positions on the landscape similar to those of the Plankinton soil. Their surface layer and subsurface layer are thicker than those of the Plankinton soil.

Organic matter content is moderate and fertility medium in the Glenham and Plankinton soils. Tilth is good in the Glenham soil. It is poor in the Plankinton soil. Permeability is moderate in the upper part of the Glenham soil and moderately slow in the underlying material. It is very slow in the Plankinton soil. Available water capacity is high in both soils. A seasonal high water table is within a depth of 1 foot part of the year in the Plankinton soil. As much as 1 foot of water may pond on this soil during wet periods. Runoff is slow on the Glenham soil and ponded on the Plankinton soil. The shrink-swell potential is moderate in the Glenham soil and high in the Plankinton soil.

Most of the acreage is cropland. These soils are suited to cultivated crops and to tame pasture and hay. Alfalfa, intermediate wheatgrass, and smooth bromegrass are suitable pasture plants on the Glenham soil. Garrison creeping foxtail and western wheatgrass are suited to the Plankinton soil. Measures that improve tilth, increase the rate of water intake, and conserve moisture are the main management needs in cultivated areas. Examples are leaving crop residue on the surface, minimizing tillage, and including grasses and legumes in the cropping sequence. Subsoiling helps to break up the dense claypan subsoil and increases the water intake rate for a short time in areas of the Plankinton soil. Farming is delayed during wet periods because of the wetness in the Plankinton soil.

These soils are suited to range. The native vegetation on the Glenham soil dominantly is western wheatgrass and green needlegrass and lesser amounts of blue grama and needleandthread. That on the Plankinton soil dominantly is western wheatgrass and lesser amounts of sedges. Overused areas of the Glenham soil are dominated by blue grama and Kentucky bluegrass. Overused areas of the Plankinton soil are dominated by buffalograss, saltgrass, and sedges. The Plankinton soil is a suitable site for excavated ponds.

The Glenham soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well. The Plankinton soil is suited to windbreaks and environmental plantings if it is drained.

The Glenham soil is in capability unit IIe-2, Silty range site; the Plankinton soil is in capability unit IVw-1, Closed Depression range site.

GrA—Glenham-Prosper loams, 0 to 3 percent slopes. These deep, gently undulating soils are on uplands. The well drained Glenham soil is on slight rises. The moderately well drained Prosper soil is in swales. It is occasionally flooded for very brief periods. Areas are irregular in shape and are 5 to 1,000 acres in size. They are 50 to 60 percent Glenham soil and 30 to 35 percent Prosper soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Glenham soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown, grayish brown, and light brownish gray, friable clay loam about 24 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam. In places the soil is calcareous within a depth of 10 inches.

Typically, the surface soil of the Prosper soil is dark gray loam about 13 inches thick. The subsoil is dark grayish brown, grayish brown, and light brownish gray, friable clay loam about 23 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light yellowish brown, calcareous clay loam.

Included with these soils in mapping are small areas of the poorly drained Plankinton and Tetonka soils in depressions. These included soils make up less than 10 percent of any one mapped area.

Organic matter content is moderate and fertility medium in the Glenham soil. Organic matter content and fertility are high in the Prosper soil. Tilth is good in both soils. Permeability is moderate in the upper part of the soils and moderately slow in the underlying material. Available water capacity is high. The Prosper soil has a seasonal high water table at a depth of 3 to 6 feet in the spring of some years. Runoff is slow on both soils. The shrink-swell potential is moderate.

Most of the acreage is cropland. These soils are suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples. Farming is delayed in some years when the Prosper soil receives runoff from adjacent uplands, but in most years the additional moisture is beneficial. These soils are suited to irrigation.

These soils are suited to range. The native vegetation on the Glenham soil dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread. That on the Prosper soil dominantly is big bluestem and lesser amounts of western wheatgrass and green needlegrass. Overused areas are dominated by blue grama and Kentucky bluegrass.

These soils are suited to windbreaks and environmental plantings. All climatically suited trees and shrubs grow well. Those that require an abundant supply of moisture grow especially well on the Prosper soil.

The Glenham soil is in capability unit IIc-2, Silty range site; the Prosper soil is in capability unit IIc-3, Overflow range site.

GrB—Glenham-Prosper loams, 1 to 6 percent slopes. These deep, undulating soils are on uplands. The well drained Glenham soil is on the higher rises. The moderately well drained Prosper soil is in swales. It is occasionally flooded for very brief periods. Areas are irregular in shape and are 5 to 225 acres in size. They are 60 to 70 percent Glenham soil and 20 to 30 percent Prosper soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Glenham soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown, grayish brown, and light brownish gray, friable clay loam about 24 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam. In places the soil is calcareous within a depth of 10 inches.

Typically, the surface soil of the Prosper soil is dark gray loam about 13 inches thick. The subsoil is dark grayish brown, grayish brown, and light brownish gray, friable clay loam about 23 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light yellowish brown, calcareous clay loam.

Included with these soils in mapping are small areas of the poorly drained Plankinton and Tetonka and very poorly drained Worthing soils in depressions. These included soils make up less than 10 percent of any one mapped area.

Organic matter content is moderate and fertility medium in the Glenham soil. Organic matter content and fertility are high in the Prosper soil. Tilth is good in both soils. Permeability is moderate in the upper part of the soils and moderately slow in the underlying material. Available water capacity is high. The Prosper soil has a seasonal high water table at a depth of 3 to 6 feet in the spring of some years. Runoff is slow on both soils. The shrink-swell potential is moderate.

Most of the acreage is cropland. These soils are suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control erosion and conserve moisture are the main management needs in cultivated areas. Minimizing tillage and leaving crop residue on the surface are examples. Contour farming, grassed waterways, and terraces also help to control erosion, but the slopes in some areas are too short or too irregular for contouring or terracing. Farming is delayed in years when the Prosper soil receives runoff from adjacent uplands, but in most years the additional moisture is beneficial. These soils are suited to irrigation.

These soils are suited to range. The native vegetation on the Glenham soil dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread. That on the Prosper soil dominantly is big bluestem and lesser amounts of western wheatgrass and green needlegrass. Overused areas are dominated by blue grama and Kentucky bluegrass.

These soils are suited to windbreaks and environmental plantings. All climatically suited trees and shrubs grow well. Those that require an abundant supply of moisture grow especially well on the Prosper soil. Planting the trees and shrubs on the contour helps to control erosion.

The Glenham soil is in capability unit IIe-2, Silty range site; the Prosper soil is in capability unit IIc-3, Overflow range site.

HbA—Highmore silt loam, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on uplands. Areas are irregular in shape and are 5 to 1,200 acres in size. Slopes generally are long and smooth.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsoil is dark grayish brown, grayish brown, and light olive brown, friable silty clay loam about 17 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light yellowish brown, calcareous silt loam. It is mottled in the lower part. In places the subsoil contains less clay. In some areas loam or clay loam glacial till is 20 to 40 inches from the surface.

Included with this soil in mapping are small areas of the moderately well drained Mobridge soils in swales. These soils make up less than 10 percent of any one mapped area.

Organic matter content is moderate and fertility medium in the Highmore soil. Tilth is good. Permeability is moderate. Available water capacity is high. Runoff is slow. The shrink-swell potential is moderate.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that conserve moisture are the main management needs. Minimizing tillage and leaving crop residue on the surface are examples (fig. 6). The soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama and Kentucky bluegrass.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well.

The capability unit is IIc-2; Silty range site.

HbB—Highmore silt loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on uplands. Areas are irregular in shape and are 5 to 1,500 acres in size. Slopes generally are long and smooth, but in some areas they are short and convex.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsoil is dark grayish brown, grayish brown, and light olive brown, friable silty clay loam about 17 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light yellowish brown, calcareous silt loam. It is mottled in the lower part. In places the subsoil contains less clay. In some areas loam or clay loam glacial till is 20 to 40 inches from the surface.

Included with this soil in mapping are small areas of Mobridge and Raber soils. These soils make up less than 15 percent of any one mapped area. The moderately well drained Mobridge soils are in swales. Raber soils contain more sand and clay in the subsoil

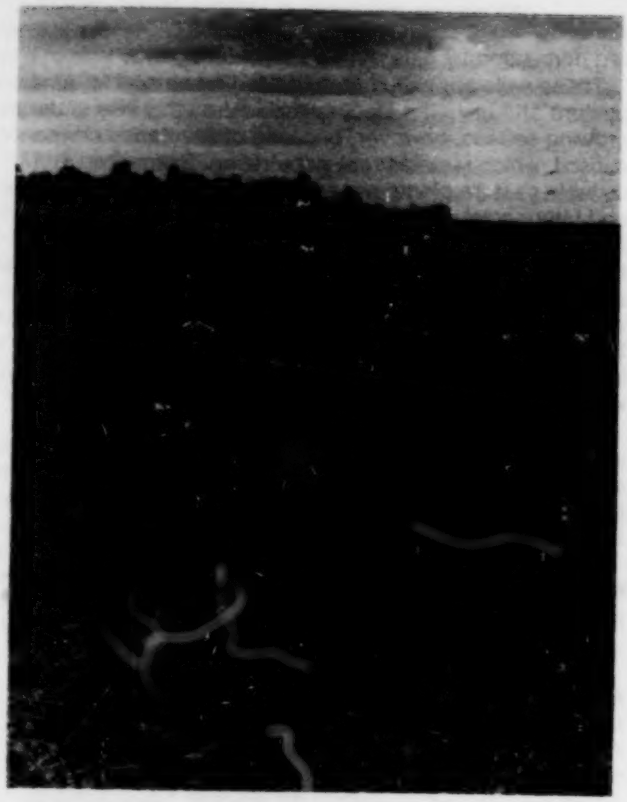

Figure 6.—Crop residue on the surface of Highmore silt loam, 0 to 2 percent slopes.

than the Highmore soil. They are on ridges and the upper side slopes.

Organic matter content is moderate and fertility medium in the Highmore soil. Tilth is good. Permeability is moderate. Available water capacity is high. Runoff is medium. The shrink-swell potential is moderate.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control erosion and conserve moisture are the main management needs. Minimizing tillage and leaving crop residue on the surface are examples. Contour farming, grassed waterways, and terraces also help to control erosion, but the slopes in some areas are too short or too irregular for contouring and terracing. The soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama or Kentucky bluegrass.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well. Planting the trees and shrubs on the contour helps to control erosion.

The capability unit is IIe-1; Silty range site.

HbC—Highmore silt loam, 6 to 9 percent slopes. This deep, well drained, moderately sloping soil is on uplands. Areas are irregular in shape and are 5 to 350 acres in size. Slopes generally are long and smooth, but in some areas they are short and convex.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsoil is dark grayish brown, grayish brown, and light olive brown, friable silty clay loam about 17 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light yellowish brown, calcareous silt loam. It is mottled in the lower part. In some areas loam or clay loam glacial till is 20 to 40 inches from the surface.

Included with this soil in mapping are small areas of Mobridge, Peno, and Raber soils. These soils make up less than 10 percent of any one mapped area. The moderately well drained Mobridge soils are in swales and on foot slopes. Peno and Raber soils contain more sand and clay in the subsoil than the Highmore soil. Also, they are slightly higher on the landscape.

Organic matter content is moderate and fertility medium in the Highmore soil. Tilth is good. Permeability is moderate. Available water capacity is high. Runoff is medium. The shrink-swell potential is moderate.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama or Kentucky bluegrass.

This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control erosion and conserve moisture are the main management needs in cultivated areas. Minimizing tillage and leaving crop residue on the surface are examples. Contour farming, grassed waterways, and terraces also help to control erosion, but the slopes in some areas are too short or too irregular for contouring and terracing.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well. Planting the trees and shrubs on the contour helps to control erosion.

The capability unit is IIIe-1; Silty range site.

HdA—Highmore-DeGrey silt loams, 0 to 2 percent slopes. These deep, nearly level soils are on uplands. The well drained Highmore soil is on rises. The moderately well drained DeGrey soil is in slightly concave areas. Areas are irregular in shape and are 5 to 50 acres in size. They are 50 to 55 percent Highmore soil and 25 to 30 percent DeGrey soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Highmore soil is dark grayish brown silt loam about 5 inches thick. The subsoil is dark grayish brown, grayish brown, and light olive brown, friable silty clay loam about 17 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light yellowish brown, calcareous silt loam. It is mottled in the lower part. In some areas loam or clay loam glacial till is 20 to 40 inches from the surface.

Typically, the surface layer of the DeGrey soil is dark grayish brown silt loam about 7 inches thick. The subsurface layer is light brownish gray silt loam about 2 inches thick. The subsoil is dark grayish brown and grayish brown, very firm and firm silty clay about 21 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is grayish brown, calcareous silty clay loam and loam. In places the subsoil does not have columnar structure.

Included with these soils in mapping are small areas of Hoven, Jerauld, and Mobridge soils. These included soils make up less than 20 percent of any one mapped area. The poorly drained Hoven soils are in depressions. The moderately well drained Jerauld soils have visible salts within a depth of 16 inches. They are in small pits and depressions. The moderately well drained Mobridge soils are in swales.

Organic matter content is moderate and fertility medium in the Highmore and DeGrey soils. Tilth is good in the Highmore soil. It is poor in the DeGrey soil. The DeGrey soil has a sodium affected subsoil that restricts root penetration. Permeability is moderate in the Highmore soil. It is very slow in the subsoil of the DeGrey soil and moderately slow in the underlying material. Available water capacity is high in the Highmore soil and moderate in the DeGrey soil. Runoff is slow on both soils. The shrink-swell potential is moderate in the Highmore soil and high in the DeGrey soil.

Most of the acreage supports native grasses. These soils are suited to range. Productivity is limited in areas of the DeGrey soil, however, because of the dense claypan subsoil. The native vegetation on the Highmore soil dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. That on the DeGrey soil dominantly is western wheatgrass and lesser amounts of green needlegrass and blue grama. Overused areas of the Highmore soil are dominated by blue grama and Kentucky bluegrass. Overused areas of the DeGrey soil are dominated by blue grama and buffalograss.

These soils are suited to cultivated crops and to tame pasture and hay. The DeGrey soil is droughty late in the growing season, however, because of the dense claypan subsoil, which restricts root penetration. Examples of suitable pasture plants are alfalfa, crested wheatgrass, and intermediate wheatgrass. Measures that conserve moisture are the main management concerns in cultivated areas. Improving tilth also is a concern in areas of the DeGrey soil. Leaving crop residue on the surface and minimizing tillage conserve moisture. Subsoiling helps to break up the dense claypan subsoil in areas of the DeGrey soil and increases the rate of water intake for a short time.

These soils are suited to windbreaks and environmental plantings. Most climatically suited trees and shrubs grow well on the Highmore soil, but optimum growth, survival, and vigor cannot be expected on the DeGrey soil.

The Highmore soil is in capability unit IIc-2, Silty range site; the DeGrey soil is in capability unit IVs-2, Claypan range site.

HfA—Highmore-Mobridge silt loams, 0 to 3 percent slopes. These deep, gently undulating soils are on uplands. The well drained Highmore soil is on slight rises. The moderately well drained Mobridge soil is in swales. It is occasionally flooded for very brief periods. Areas are irregular in shape and are 5 to 1,500 acres in size. They are 50 to 60 percent Highmore soil and 25 to 35 percent Prosper soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Highmore soil is dark grayish brown silt loam about 5 inches thick. The subsoil is dark grayish brown, grayish brown, and light olive brown, friable silty clay loam about 17 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light yellowish brown, calcareous silt loam. It is mottled in the lower part. In some areas the subsoil contains less clay. In places loam or clay loam glacial till is 20 to 40 inches from the surface.

Typically, the surface soil of the Mobridge soil is dark grayish brown silt loam about 10 inches thick. The subsoil is dark grayish brown and grayish brown, friable silty clay loam about 25 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous silt loam.

Included with these soils in mapping are small areas of Plankinton, Raber, and Tetonka soils. These included soils make up less than 15 percent of any one mapped area. The poorly drained Plankinton and Tetonka soils are in depressions. The well drained Raber soils contain more sand and clay in the subsoil than the Highmore and Mobridge soils. They are on ridges.

Organic matter content is moderate and fertility medium in the Highmore soil. Organic matter content and fertility are high in the Mobridge soil. Tilth is good in both soils. Permeability is moderate. Available water capacity is high. Runoff is slow. The shrink-swell potential is moderate.

Most of the acreage is cropland. These soils are suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that conserve moisture are the main management needs. Leaving crop residue on the surface and minimizing tillage are examples. Farming is delayed in some years when the Mobridge soil receives runoff from adjacent uplands, but in most years the additional moisture is beneficial. These soils are suited to irrigation.

These soils are suited to range. The native vegetation on the Highmore soil dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. That on the Mobridge soil dominantly is big bluestem and lesser amounts of green needlegrass and western wheatgrass. Overused areas of the Highmore soil are dominated by blue grama and Kentucky bluegrass. Overused areas of the Mobridge soil are dominated by western wheatgrass and Kentucky bluegrass.

These soils are suited to windbreaks and environmental plantings. All climatically suited trees and shrubs grow well. Those that require an abundant supply of moisture grow especially well on the Mobridge soil.

The Highmore soil is in capability unit IIc-2, Silty range site; the Mobridge soil is in capability unit IIc-3, Overflow range site.

HgB—Highmore-Peno complex, stony, 2 to 6 percent slopes. These deep, well drained, undulating soils are on uplands. The Highmore soil is on long, smooth slopes. The Peno soil is on knolls and ridges. Few to many scattered stones are on the surface and throughout the Peno soil. In some areas "tepee rings" are on the surface (fig. 7). Areas are irregular in shape and are 5 to 800 acres in size. They are 50 to 65 percent Highmore soil and 25 to 35 percent Peno soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Highmore soil is dark grayish brown silt loam about 5 inches thick. The subsoil is dark grayish brown, grayish brown, and light olive brown, friable silty clay loam about 17 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light yellowish brown, calcareous silt loam. It is mottled in the lower part. In places loam or clay loam glacial till is at a depth of 20 to 40 inches.

Typically, the surface layer of the Peno soil is dark grayish brown stony loam about 4 inches thick. The subsoil is dark grayish brown and grayish brown, firm clay loam about 11 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and grayish brown, calcareous clay loam. Stones make up 5 to 30 percent of the subsoil and underlying material. In places free carbonates are below a depth of 12 inches.

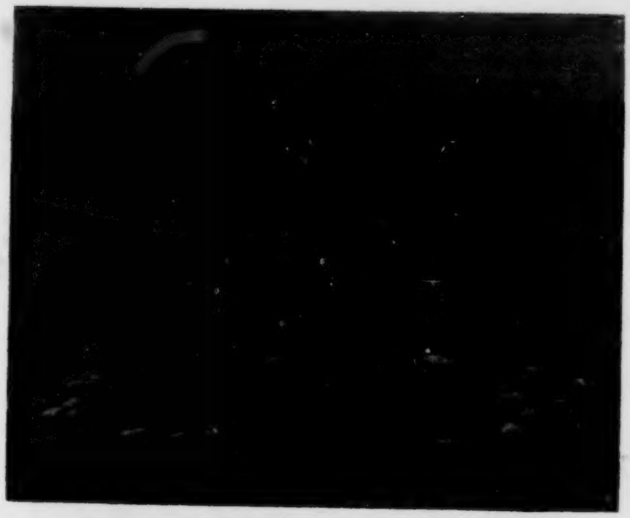

Figure 7.—"Tepee rings" in an area of Highmore-Peno complex, stony, 2 to 6 percent slopes. The Sioux used these rings of stones to hold the sides of tepees down.

Included with these soils in mapping are small areas of Gettys and Mobridge soils. These included soils make up less than 15 percent of any one mapped area. The stony Gettys soils have free carbonates at or near the surface and are not dark to so great a depth as the Highmore and Peno soils. They are on short, steep slopes and ridges. The moderately well drained Mobridge soils are in swales.

Organic matter content is moderate and fertility medium in the Highmore and Peno soils. Tilth is good in the Highmore soil. It is poor in the Peno soil. Permeability is moderate in the Highmore soil and moderately slow in the Peno soil. Available water capacity is high in both soils. Runoff is medium. The shrink-swell potential is moderate in the Highmore soil and high in the Peno soil.

Most of the acreage supports native grasses. These soils are suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama, Kentucky bluegrass, and buffalograss.

This map unit generally is unsuited to cultivated crops and to tame pasture and hay because of the stoniness of the Peno soil. Tame pasture plants and hay can be grown in areas of the Highmore soil, but these areas are widely scattered. The Peno soil is too stony for seedbed preparation, cultivation, and haying. Cultivated crops can be grown in areas of the Highmore soil, but these areas are small and intermingled with areas of the stony Peno soil.

This map unit is suited to windbreaks and environmental plantings, but the stoniness of the Peno soil is a limitation. Because the stony Peno soil is intermingled throughout the map unit, trees generally cannot be planted by machine. They can be planted by hand. Planting trees and shrubs on the contour helps to control erosion.

The Highmore soil is in capability unit IIe-1, Silty range site; the Peno soil is in capability unit VIIs-6, Clayey range site.

HgC—Highmore-Peno complex, stony, 6 to 9 percent slopes. These deep, well drained, moderately sloping soils are on uplands. The Highmore soil is on long, smooth slopes. The Peno soil is on knolls and ridges. Few to many scattered stones are on the surface and throughout the Peno soil. Areas are irregular in shape and are 5 to 200 acres in size. They are 45 to 50 percent Highmore soil and 30 to 40 percent Peno soil. These two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Highmore soil is dark grayish brown silt loam about 5 inches thick. The subsoil is dark grayish brown, grayish brown, and light olive brown, friable silty clay loam about 17 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light yellowish brown, calcareous silt loam. It is mottled in the lower part. In places loam or clay loam glacial till is at a depth of 20 to 40 inches.

Typically, the surface layer of the Peno soil is dark grayish brown stony loam about 4 inches thick. The subsoil is dark grayish brown and grayish brown, firm clay loam about 11 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and grayish brown, calcareous clay loam. Stones make up 5 to 30 percent of the subsoil and underlying material. In places free carbonates are below a depth of 11 inches.

Included with these soils in mapping are small areas of Gettys and Mobridge soils. These included soils make up less than 20 percent of any one mapped area. The stony Gettys soils have free carbonates at or near the surface and are not dark to so great a depth as the Highmore and Peno soils. They are on short, steep slopes and ridges. The moderately well drained Mobridge soils are in swales.

Organic matter content is moderate and fertility medium in the Highmore and Peno soils. Tilth is good in the Highmore soil. It is poor in the Peno soil. Permeability is moderate in the Highmore soil and moderately slow in the Peno soil. Available water capacity is high in both soils. Runoff is medium. The shrink-swell potential is moderate in the Highmore soil and high in the Peno soil.

Most of the acreage supports native grasses. These soils are suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama, Kentucky bluegrass, and buffalograss.

This map unit generally is unsuited to cultivated crops and to tame pasture and hay because of the stoniness of the Peno soil. Tame pasture plants and hay can be grown in areas of the Highmore soil, but these areas are widely scattered. The Peno soil is too stony for seedbed preparation, cultivation, and haying. Cultivated crops can be grown in areas of the Highmore soil, but these areas are small and intermingled with areas of the stony Peno soil.

This map unit is suited to windbreaks and environmental plantings, but the stoniness of the Peno soil is a limitation. Because the stony Peno soil is intermingled throughout the map unit, trees generally cannot be planted by machine. They can be planted by hand. Planting trees and shrubs on the contour helps to control erosion.

The Highmore soil is in capability unit IIIe-1, Silty range site; the Peno soil is in capability unit VIIs-6, Clayey range site.

Ho—Hoven silt loam. This deep, poorly drained, level soil is in depressions in the uplands. It is ponded during periods of snowmelt or heavy rainfall. Areas are circular or oblong and are 5 to 550 acres in size.

Typically, the surface layer is gray silt loam about 4 inches thick. The subsoil is about 26 inches thick. It is dark gray, firm clay and silty clay. The underlying material to a depth of 60 inches is grayish brown and dark gray, calcareous silty clay loam.

Included with this soil in mapping are small areas of Plankinton, Tetonka, and the very poorly drained Worthing soils. These soils make up less than 20 percent of any one mapped area. They do not have a sodium affected subsoil. They are in positions on the landscape similar to those of the Hoven soil.

Organic matter content is moderate and fertility medium in the Hoven soil. The high content of sodium adversely affects the growth of most plants. The dense claypan subsoil limits the penetration of plant roots. Permeability is very slow. Available water capacity is moderate. A seasonal high water table is within a depth of 1.5 feet part of the year. As much as 1.0 foot of water ponds on the surface during some wet periods. Runoff is ponded. The shrink-swell potential is high.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is western wheatgrass and lesser amounts of sedges and saltgrass. Overused areas are dominated by buffalograss, saltgrasses, and sedges. Many areas are potential sites for excavated ponds.

This soil generally is unsuited to cultivated crops and to windbreaks and environmental plantings because of the ponding and the dense claypan subsoil. It is suited to tame pasture and hay. Garrison creeping foxtail and western wheatgrass are suitable species.

The capability unit is VIs-1; Closed Depression range site.

Hu—Hurley silt loam. This moderately deep, moderately well drained, nearly level to gently sloping soil is on uplands. Areas are irregular in shape or long and narrow and are 5 to 175 acres in size. Slopes are smooth or slightly concave.

Typically, the surface layer is gray silt loam about 3 inches thick. The subsoil is dark gray and dark grayish brown, firm clay about 13 inches thick. The underlying material is grayish brown shaly clay about 9 inches thick. Light brownish gray shale is at a depth of about 25 inches. In places the depth to shale is more than 40 inches.

Included with this soil in mapping are small areas of Opal and Promise soils and Slickspots. These soils make up less than 15 percent of any one mapped area. The well drained Opal and Promise soils do not have a sodium affected subsoil. They are on slight rises. Slickspots occur as bare areas where visible salts are at or near the surface. They are in small depressions.

Organic matter content and fertility are low in the Hurley soil. Tilth is poor. Root penetration is restricted by the dense claypan subsoil and the high content of sodium salts. Permeability is very slow. Available water capacity is low. Runoff is medium. The shrink-swell potential is very high.

Most of the acreage supports native grasses. This soil is suited to range, but the dense claypan subsoil limits productivity. The native vegetation dominantly is blue grama and western wheatgrass and lesser amounts of buffalograss. Overused areas are dominated by blue grama, buffalograss, and saltgrass.

This soil is generally unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings. The dense claypan subsoil, the high content of salts in the subsoil, and the low available water capacity are limitations.

The capability unit is VIs-1; Thin Claypan range site.

Hz—Hurley-Slickspots complex. This map unit occurs as areas of a moderately deep, moderately well drained, nearly level to gently sloping Hurley soil intermingled with Slickspots on uplands. The Hurley soil is on slight rises, and the Slickspots are in small depressions (fig. 8). Slopes are slightly concave. Areas are irregular in shape and are 5 to 150 acres in size. They are 45 to 60 percent Hurley soil and 25 to 40 percent Slickspots. The Hurley soil and Slickspots occur as areas so closely intermingled or so small that mapping them separately is not practical.

Figure 8.—An area of Hurley-Slickspots complex. The Hurley soil is in the slightly higher, more vegetated areas.

Typically, the surface layer of the Hurley soil is gray silt loam about 3 inches thick. The subsoil is dark gray and dark grayish brown, firm clay about 13 inches thick. The underlying material is grayish brown shaly clay about 9 inches thick. Light brownish gray shale is at a depth of about 25 inches. In places the depth to shale is more than 40 inches. In some areas the soil formed in loamy glacial till.

The surface of the Slickspots is so crusted that it is nearly impervious to water. Visible accumulations of salts are at or near the surface. The soil material to a depth of 60 inches is dense, massive clay.

Included with the Hurley soil and the Slickspots in mapping are small areas of the well drained Opal and Promise soils. These included soils make up less than 15 percent of any one mapped area. They do not have a sodium affected subsoil. They are slightly higher on the landscape than the Hurley soil.

Organic matter content and fertility are low in the Hurley soil. Tilth is poor. Root penetration is restricted by the dense claypan subsoil and the high content of sodium salts. Permeability is very slow. Available water capacity is low. Runoff is medium. The shrink-swell potential is very high.

All of the acreage supports native grasses. The Hurley soil is suited to range, but the dense claypan subsoil limits productivity. The native vegetation on this soil dominantly is blue grama and western wheatgrass and lesser amounts of buffalograss. Overused areas are dominated by blue grama, buffalograss, pricklypear, and saltgrass. The Slickspots support a sparse stand of annual weeds and cacti during wet periods.

This map unit is generally unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings. The dense claypan subsoil, the high content of salts in the subsoil, the low available water capacity, and the bare areas are limitations.

The Hurley soil is in capability unit VIs-1, Thin Claypan range site; the Slickspots are in capability unit VIIIs-3 and are not assigned to a range site.

JbC—Java-Betts loams, 6 to 9 percent slopes. These deep, well drained, gently rolling soils are on uplands. The Java soil is on side slopes. The Betts soil is on knolls and ridges (fig. 9). Scattered stones are on the surface in most areas of range. Areas are irregular in shape and are 5 to 625 acres in size. They are 50 to 70 percent Java soil and 20 to 35 percent Betts soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Java soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown and light brownish gray, very friable clay loam about 12 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is pale yellow and light gray, calcareous clay loam. In places free carbonates are leached below a depth of 10 inches.

Typically, the surface layer of the Betts soil is dark grayish brown, calcareous loam about 4 inches thick. The transitional layer is about 4 inches of light brownish gray, calcareous clay loam. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam.

Included with these soils in mapping are small areas of Plankinton, Prosper, Tetonka, and Worthing soils. These included soils make up less than 20 percent of any one mapped area. The poorly drained Plankinton and Tetonka soils and the very poorly drained Worthing soils are in depressions. The moderately well drained Prosper soils are in swales. Also included are small areas of the very stony Betts soils on ridges. These areas range from 1 to 4 acres in size.

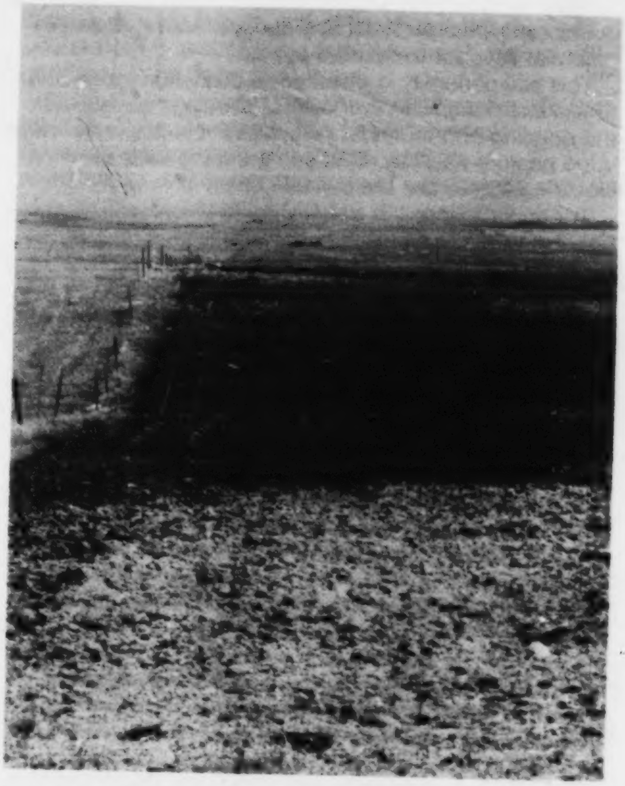

Figure 9.—An area of Java-Betts loams, 6 to 9 percent slopes. The darker Java soil is on side slopes. The lighter Betts soil is on ridges.

Organic matter content and fertility are low in the Java and Betts soils. Permeability is moderate in the upper part of the soils and moderately slow in the underlying material. Available water capacity is high in both soils. Runoff is medium. The shrink-swell potential is moderate.

Most of the acreage supports native grasses. These soils are suited to range. The native vegetation on the Java soil dominantly is western wheatgrass and green needlegrass and lesser amounts of little bluestem, needleandthread, and sideoats grama. That on the Betts soil dominantly is little bluestem and lesser amounts of sideoats grama, blue grama, western wheatgrass, and needleandthread. Overused areas are dominated by blue grama and threadleaf sedge.

These soils are suited to cultivated crops. Measures that control erosion and conserve moisture are the main management needs. Improving fertility also is a concern because the high content of lime near the surface in the Betts soil adversely affects the availability of plant nutrients. Leaving crop residue on the surface, minimizing tillage, and including grasses and legumes in the cropping sequence conserve moisture and improve fertility. Contour farming, grassed waterways, and terraces help to control erosion; however, the slopes in some areas are too short or too irregular for contouring and terracing. The scattered surface stones in some areas hinder the use of farm machinery. They should be removed annually.

These soils are suited to tame pasture and hay. Production is limited by the high content of lime near the surface. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, pubescent wheatgrass, and smooth bromegrass. In some areas the scattered stones interfere with haying.

These soils are suited to windbreaks and environmental plantings, but the high content of lime near the surface is a limitation. Trees and shrubs can be established, but optimum growth and survival cannot be expected. Planting the trees and shrubs on the contour helps to control erosion.

The capability unit is IVe-3; the Java soil is in the Silty range site, the Betts soil in the Thin Upland range site.

JgB—Java-Glenham loams, 2 to 6 percent slopes. These deep, well drained, gently sloping and undulating soils are on uplands. The Java soil is on knolls and ridges. The Glenham soil is on side slopes. Scattered stones are on the surface in most areas of range. Areas are irregular in shape and are 5 to 500 acres in size. They are 45 to 60 percent Java soil and 35 to 45 percent Glenham soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Java soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown and light brownish gray, very friable clay loam about 12 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is pale yellow and light gray, calcareous clay loam.

Typically, the surface layer of the Glenham soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown, grayish brown, and light brownish gray, friable clay loam about 24 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam.

Included with these soils in mapping are small areas of Betts, Plankinton, Prosper, Tetonka, and Worthing soils. These included soils make up less than 15 percent of any one mapped area. Betts soils have a surface layer that is less than 4 inches thick. They are on the steeper ridges and knolls. The poorly drained Plankinton and Tetonka soils are in depressions. The moderately well drained Prosper soils are in swales. The very poorly drained Worthing soils are in depressions. Also included are small areas of the stony Betts soils on ridges. These areas range from 1 to 4 acres in size.

Organic matter content is moderate and fertility medium in the Glenham soil. Organic matter content and fertility are low in the Java soil. Tilth is good in both soils. Permeability is moderate in the upper part of the soils and moderately slow in the underlying material. Available water capacity is high. Runoff is medium. The shrink-swell potential is moderate.

Most of the acreage is cropland. These soils are suited to cultivated crops, but the high content of lime near the surface of the Java soil adversely affects the availability of plant nutrients. Measures that control erosion and conserve moisture are the main management needs. Improving fertility also is a concern in areas of the Java soil. Leaving crop residue on the surface and including grasses and legumes in the cropping sequence conserve moisture and improve fertility. Contour farming, grassed waterways, and terraces help to control erosion, but the slopes in some areas are too short or too irregular for contouring and terracing. The scattered surface stones in some areas hinder the use of farm machinery. They should be removed annually.

These soils are suited to tame pasture and hay. Production is somewhat limited in areas of the Java soil by the high content of lime near the surface. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. In some areas the scattered stones interfere with haying.

These soils are suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of little bluestem, needleandthread, and blue grama. Overused areas are dominated by blue grama and threadleaf sedge.

These soils are suited to windbreaks and environmental plantings, but the high content of lime near the surface of the Java soil is a limitation. Trees and shrubs can be established on the Java soil, but optimum survival, growth, and vigor are unlikely. Planting the trees and shrubs on the contour helps to control erosion.

The Java soil is in capability unit IIIe-12, the Glenham soil in capability unit IIe-2; both soils are in the Silty range site.

JmE—Java-Schamber complex, 9 to 25 percent slopes. These strongly sloping and moderately steep soils are on uplands. The well drained Java soil is on low side slopes and foot slopes. The excessively drained Schamber soil is on the upper side slopes and on ridges. It is very shallow over very gravelly sand. Areas are irregular in shape and are 5 to 800 acres in size. They are 45 to 55 percent Java soil and 25 to 40 percent Schamber soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Java soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown and light brownish gray, very friable clay loam about 12 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is pale yellow and light gray, calcareous clay loam. In places free carbonates are leached below a depth of 10 inches.

Typically, the surface layer of the Schamber soil is dark grayish brown gravelly loam about 4 inches thick. The underlying material to a depth of 60 inches is multicolored, calcareous very gravelly sand.

Included with these soils in mapping are small areas of Betts, Delmont, Gettys, and Lowry soils. These included soils make up less than 25 percent of any one mapped area. Betts and Gettys soils are not dark to so great a depth as the Java soil. They are in positions on the landscape similar to those of the Schamber soil. The silty Lowry soils are on convex slopes above the Java and Schamber soils. The somewhat excessively drained Delmont soils are 10 to 20 inches deep to gravelly material. They are in the less sloping areas below the Schamber soil.

Organic matter content and fertility are low in the Java and Schamber soils. Permeability is moderate in the upper part of the Java soil and moderately slow in the underlying material. It is rapid in the Schamber soil. Available water capacity is high in the Java soil and low in the Schamber soil. Runoff is medium on the Java soil and slow on the Schamber soil. The shrink-swell potential is moderate in the Java soil and low in the Schamber soil.

Most of the acreage supports native grasses. These soils are suited to range. Productivity is limited because the Schamber soil is droughty. The native vegetation on the Java soil dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. That on the Schamber soil dominantly is needleandthread and blue grama and lesser amounts of threadleaf sedge. Overused areas are dominated by threadleaf sedge, blue grama, and weeds.

These soils generally are unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings because of the slope of both soils and the droughtiness of the Schamber soil.

The Java soil is in capability unit VIe-3, Silty range site. The Schamber soil is in capability unit VIs-4, Very Shallow range site.

Jr—Jerauld silt loam. This deep, moderately well drained, nearly level soil is on uplands. Areas are irregular in shape and are 5 to 150 acres in size. Slopes are smooth or slightly concave.

Typically, the surface layer is gray silt loam about 3 inches thick. The subsoil is about 15 inches thick. It is dark grayish brown and grayish brown, firm, calcareous silty clay and clay. The underlying material to a depth of 60 inches is grayish brown and olive gray, calcareous clay.

Included with this soil in mapping are small areas of Cavo and Raber soils and Slickspots. These soils make up less than 25 percent of any one mapped area. Cavo soils have a surface layer that is thicker than that of the Jerauld soil and do not have visible salts within a depth of 16 inches. The well drained Raber soils do not have a sodium affected subsoil. Cavo and Raber soils are on slight rises. Slickspots occur as bare spots where visible salts are at or near the surface. They are in small depressions.

Organic matter content and fertility are low in the Jerauld soil. Root penetration is restricted by the dense claypan subsoil and the high content of sodium salts. Permeability is very slow. Available water capacity is moderate. Because of the claypan subsoil and the high content of salts in the subsoil, however, moisture is released slowly to plants. Runoff is slow. The shrink-swell potential is high.

Most of the acreage supports native grasses. This soil is suited to range, but productivity is limited by the dense, compact subsoil. The native vegetation dominantly is western wheatgrass and blue grama and lesser amounts of buffalograss. Overused areas are dominated by blue grama and buffalograss.

This soil is generally unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings. The dense claypan subsoil and the high content of salts in the subsoil are limitations.

The capability unit is VIs-1; Thin Claypan range site.

LoA—Lowry silt loam, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on uplands. Areas are irregular in shape and are 5 to 800 acres in size. Slopes are smooth or slightly convex.

Typically, the surface soil is dark grayish brown silt loam about 5 inches thick. The subsoil is dark grayish brown and grayish brown, very friable silt loam about 14 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous silt loam. In places the subsoil contains more clay.

Included with this soil in mapping are small areas of the moderately well drained Mobridge soils in swales. These soils make up less than 15 percent of any one mapped area.

Organic matter content is moderate and fertility medium in the Lowry soil. Tilth is good. Permeability is moderate. Available water capacity is high. Runoff is slow.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that conserve moisture are the main management needs.

Leaving crop residue on the surface and minimizing tillage are examples. The soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and little bluestem. Overused areas are dominated by blue grama or Kentucky bluegrass.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well.

The capability unit is IIc-2; Silty range site.

LoB—Lowry silt loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on uplands. Areas are irregular in shape and are 5 to 600 acres in size. Slopes are long and smooth.

Typically, the surface soil is dark grayish brown silt loam about 5 inches thick. The subsoil is dark grayish brown and grayish brown, very friable silt loam about 14 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous silt loam. In places the subsoil contains more clay.

Included with this soil in mapping are small areas of the moderately well drained Mobridge soils in swales. These soils make up less than 10 percent of any one mapped area.

Organic matter content is moderate and fertility medium in the Lowry soil. Tilth is good. Permeability is moderate. Available water capacity is high. Runoff is medium.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control erosion and conserve moisture are the main management needs in cultivated areas. Examples are leaving crop residue on the surface, farming on the contour, establishing grassed waterways, and terracing. In some areas the slopes are too short or too irregular for contouring and terracing. The soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and little bluestem. Overused areas are dominated by blue grama or Kentucky bluegrass.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well. Planting on the contour helps to control erosion.

The capability unit is IIe-1; Silty range site.

LoC—Lowry silt loam, 6 to 9 percent slopes. This deep, well drained, moderately sloping soil is on uplands. Areas are irregular in shape and are 5 to 550 acres in size. Slopes are convex.

Typically, the surface soil is dark grayish brown silt loam about 5 inches thick. The subsoil is dark grayish brown and grayish brown, very friable silt loam about 14 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous silt loam. In places the subsoil contains more clay.

Included with this soil in mapping are small areas of the moderately well drained Mobridge soils in swales. These soils make up less than 20 percent of any one mapped area.

Organic matter content is moderate and fertility medium in the Lowry soil. Tilth is good. Permeability is moderate. Available water capacity is high. Runoff is medium.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and little bluestem. Overused areas are dominated by blue grama and Kentucky bluegrass.

This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control erosion and conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface, farming on the contour, establishing grassed waterways, and terracing help to control erosion. In some areas the slopes are too short or too irregular for contouring and terracing.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well. Planting on the contour helps to control erosion.

The capability unit is IIIe-1; Silty range site.

LpC—Lowry-Peno complex, 6 to 9 percent slopes. These deep, well drained, gently sloping soils are on uplands. The Lowry soil is on long, smooth slopes. The Peno soil is on knolls and ridges. Few to many scattered stones are on the surface and throughout the Peno soil. Areas are irregular in shape and are 5 to 125 acres in size. They are 55 to 65 percent Lowry soil and 25 to 30 percent Peno soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface soil of the Lowry soil is dark grayish brown silt loam about 5 inches thick. The subsoil is dark grayish brown and grayish brown, very friable silt loam about 14 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous silt loam. In some areas the subsoil contains more clay. In other areas loam or clay loam glacial till is 20 to 40 inches from the surface. In places the surface layer is not so dark.

Typically, the surface layer of the Peno soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown and grayish brown, firm clay loam about 11 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and grayish brown, calcareous clay loam. In places free carbonates are below a depth of 12 inches.

Included with these soils in mapping are small areas of the stony Gettys soils. These included soils make up less than 15 percent of any one mapped area. They have free carbonates at or near the surface and are not dark to so great a depth as the Lowry and Peno soils. They are on short, steep slopes and ridges.

Organic matter content is moderate and fertility medium in the Lowry and Peno soils. Permeability is moderate in the Lowry soil and moderately slow in the Peno soil. Available water capacity is high in both soils. Runoff is medium. The shrink-swell potential is low in the Lowry soil and high in the Peno soil.

Most of the acreage supports native grasses. These soils are suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama, Kentucky bluegrass, and buffalograss.

These soils are suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control erosion are the main management needs in cultivated areas. Examples are leaving crop residue on the surface, farming on the contour, establishing grassed waterways, and terracing. In some areas the slopes are too short or too irregular for contouring and terracing. The scattered surface stones in some areas of the Peno soil hinder the use of farm machinery. They should be removed annually.

These soils are suited to windbreaks and environmental plantings. Most climatically suited trees and shrubs grow well, except for those that require an abundant supply of moisture. Planting on the contour helps to control erosion.

The Lowry soil is in capability unit IIIe-1, Silty range site; the Peno soil is in capability unit IVe-3, Clayey range site.

LpD—Lowry-Peno complex, 9 to 15 percent slopes. These deep, well drained, strongly sloping soils are on uplands. The Lowry soil is on long, smooth slopes. The Peno soil is on knolls and ridges. Few to many scattered stones are throughout the Peno soil. Areas are irregular in shape and are 5 to 275 acres in size. They are 45 to 55 percent Lowry soil and 30 to 35 percent Peno soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface soil of the Lowry soil is dark grayish brown silt loam about 5 inches thick. The subsoil is dark grayish brown and grayish brown, very friable silt loam about 14 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous silt loam. In some areas the subsoil contains more clay. In other areas loam or clay loam glacial till is 20 to 40 inches from the surface. In places the surface layer is not so dark.

Typically, the surface layer of the Peno soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown and grayish brown, firm clay loam about 11 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and grayish brown, calcareous clay loam. In places free carbonates are below a depth of 12 inches.

Included with these soils in mapping are small areas of the stony Gettys soils. These included soils make up less than 15 percent of any one mapped area. They have free carbonates at or near the surface and are not dark to so great a depth as the Lowry and Peno soils. They are on short, steep slopes and ridges.

Organic matter content is moderate and fertility medium in the Lowry and Peno soils. Permeability is moderate in the Lowry soil and moderately slow in the Peno soil. Available water capacity is high in both soils. Runoff is medium. The shrink-swell potential is low in the Lowry soil and high in the Peno soil.

Most of the acreage supports native grasses. These soils are suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama, Kentucky bluegrass, and buffalograss.

This map unit is suited to cultivated crops, but the slope of the Peno soil is a limitation. These soils are suited to alfalfa, intermediate wheatgrass, and smooth bromegrass for tame pasture and hay. Measures that control erosion and conserve moisture are the main management needs if the soils are cultivated. Examples are leaving crop residue on the surface, minimizing tillage, and including grasses and legumes in the cropping sequence. Contour farming, grassed waterways, and terraces also can help to control erosion, but the slopes in most areas are too short or too irregular for contouring and terracing. The scattered surface stones in areas of the Peno soil hinder the use of farm machinery. They should be removed annually.

These soils are suited to windbreaks and environmental plantings. Most climatically suited trees and shrubs grow well on the Lowry soil, but the slope of the Peno soil is a limitation. Planting on the contour helps to control erosion.

The Lowry soil is in capability unit IVe-1, Silty range site; the Peno soil is in capability unit VIe-3, Clayey range site.

Mo—Mobridge silt loam. This deep, moderately well drained, nearly level soil is in swales in the uplands. It is occasionally flooded for very brief periods. Areas are long and narrow or irregular in shape. They are [illegible] acres in size. Slopes are smooth or slightly concave.

Typically, the surface soil is dark grayish brown silt loam about 10 inches thick. The subsoil is dark gray brown and grayish brown, friable silty clay loam about 25 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous silt loam.

Included with this soil in mapping are small areas of Agar, Highmore, Hoven, and Tetonka soils. These soils make up less than 15 percent of any one mapped area. The well drained Agar and Highmore soils are higher on the landscape than the Mobridge soil. The poorly drained Hoven and Tetonka soils are in depressions.

Organic matter content and fertility are high in the Mobridge soil. Tilth is good. Permeability is moderate. Runoff is slow. Available water capacity is high. The shrink-swell potential is moderate.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smootn bromegrass. Measures that conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface is an example. Farming is delayed some years when the soil receives runoff from the adjacent uplands, but in most years the additional moisture is beneficial. Grassed waterways help to remove excess water. The soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is big bluestem and lesser amounts of green needlegrass and western wheatgrass. Overused areas are dominated by western wheatgrass and Kentucky bluegrass.

This soil is suited to windbreaks and environmental plantings. All climatically suited trees and shrubs grow well. Those that require an abundant supply of moisture grow especially well.

The capability unit is IIc-3; Overflow range site.

OaA—Oahe loam, 0 to 2 percent slopes. This well drained, nearly level soil is on outwash plains and terraces. It is moderately deep over gravelly sand. Areas are irregular in shape and are 5 to 2,000 acres in size. Slopes are long and smooth.

Typically, the surface layer is dark gray loam about 5 inches thick. The subsoil is dark grayish brown, very friable clay loam about 9 inches thick. The upper 8 inches of the underlying material is light brownish gray, calcareous loam. The lower part to a depth of 60 inches is multicolored, calcareous gravelly sand. In some areas the dark colors extend below a depth of 20 inches. In places the depth to gravelly material is less than 20 or more than 40 inches.

Organic matter content is moderate and fertility medium in the Oahe soil. Tilth is good. Permeability is moderate in the upper part of the soil and rapid in the underlying material. Available water capacity is low. Runoff is slow.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay, but it is droughty. Examples of suitable pasture plants are alfalfa, crested wheatgrass, intermediate wheatgrass, pubescent wheatgrass, and smooth bromegrass. Measures that conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples. The soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama and Kentucky bluegrass.

This soil is suited to windbreaks and environmental plantings, but the droughtiness is a limitation. Trees and shrubs can be established, but optimum survival, growth, and vigor are unlikely.

The capability unit is IIIs-2; Silty range site.

OaB—Oahe loam, 2 to 6 percent slopes. This well drained, gently sloping soil is on outwash plains and terraces. It is moderately deep over gravelly sand. Areas are irregular in shape and are 5 to 400 acres in size. Slopes are convex.

Typically, the surface layer is dark gray loam about 5 inches thick. The subsoil is dark grayish brown, very friable clay loam about 9 inches thick. The upper 8 inches of the underlying material is light brownish gray, calcareous loam. The lower part to a depth of 60 inches is multicolored, calcareous gravelly sand. In places the dark colors extend below a depth of 20 inches. In some areas the depth to gravelly material is more than 40 or less than 20 inches.

Organic matter content is moderate and fertility medium in the Oahe soil. Tilth is good. Permeability is moderate in the upper part of the soil and rapid in the underlying material. Available water capacity is low. Runoff is medium.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay, but it is droughty. Examples of suitable pasture plants are alfalfa, crested wheatgrass, intermediate wheatgrass, pubescent wheatgrass, and smooth bromegrass. Measures that control erosion and conserve moisture are the main management needs. Leaving crop residue on the surface, minimizing tillage, and including grasses and legumes in the cropping sequence are examples.

Contour farming and grassed waterways also help to control erosion, but the slopes in some areas are too short or too irregular for contouring. The soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama and Kentucky bluegrass.

This soil is suited to windbreaks and environmental plantings, but the droughtiness is a limitation. Trees and shrubs can be established, but optimum survival, growth, and vigor are unlikely.

The capability unit is IIIe-6; Silty range site.

OdB—Oahe-Delmont loams, 2 to 6 percent slopes. These gently sloping and gently undulating soils are on outwash plains and terraces. The well drained Oahe soil is on side slopes and in swales. It is moderately deep over gravelly sand. The somewhat excessively drained Delmont soil is in convex areas. It is shallow over gravelly material. Areas are irregular in shape and are 5 to 200 acres in size. They are 55 to 60 percent Oahe soil and 35 to 40 percent Delmont soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Oahe soil is dark gray loam about 5 inches thick. The subsoil is dark grayish brown, very friable clay loam about 9 inches thick. The upper 8 inches of the underlying material is light brownish gray, calcareous loam. The lower part to a depth of 60 inches is multicolored, calcareous gravelly sand. In some areas the dark colors extend below a depth of 20 inches. In other areas the depth to gravelly material is more than 40 inches.

Typically, the surface layer of the Delmont soil is dark grayish brown loam about 4 inches thick. The subsoil is grayish brown, very friable loam about 12 inches thick. The underlying material to a depth of 60 inches is multicolored, calcareous gravelly loamy sand.

Organic matter content is moderate and fertility medium in the Oahe and Delmont soils. Tilth is good. Permeability is moderate in the upper part of the soils and rapid in the underlying material. Available water capacity is low. Runoff is medium.

Most of the acreage is cropland. These soils are suited to cultivated crops and to tame pasture and hay, but they are droughty. The choice of pasture plants is limited to species tolerant of drought. Alfalfa, crested wheatgrass, intermediate wheatgrass, pubescent wheatgrass, and smooth bromegrass are suitable. Measures that control erosion and conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples. Grassed waterways and contour farming also help to control erosion, but the slopes in some areas are too short or too irregular for contouring. These soils are suited to irrigation.

These soils are suited to range. The native vegetation on the Oahe soil dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. That on the Delmont soil dominantly is needleandthread and lesser amounts of blue grama, little bluestem, and threadleaf sedge. Overused areas of the Oahe soil are dominanted by blue grama and Kentucky bluegrass. Overused areas of the Delmont soil are dominated by threadleaf sedge and blue grama.

These soils are suited to windbreaks and environmental plantings; however, droughtiness is a limitation. Trees and shrubs can be established, but optimum survival, growth, and vigor are unlikely.

The Oahe soil is in capability unit IIIe-6, Silty range site; the Delmont soil is in capability unit IVe-6, Shallow to Gravel range site.

OkF—Okaton silty clay, 15 to 40 percent slopes. This shallow, well drained, moderately steep and steep soil is on the breaks along Lake Oahe. Areas are irregular in shape and are 5 to 850 acres in size. Slopes are short and convex.

Typically, the surface layer is grayish brown, calcareous silty clay about 4 inches thick. Below this is a transitional layer of grayish brown, calcareous silty clay about 8 inches thick. The underlying material is light brownish gray, calcareous very shaly clay. Light brownish gray, calcareous shale is at a depth of about 16 inches. In some areas the soil contains less clay and is not so friable.

Included with this soil in mapping are small areas of Opal soils. These soils make up less than 15 percent of any one mapped area. They are 20 to 40 inches deep to shale. They are on the less sloping parts of the landscape.

Organic matter content and fertility are low in the Okaton soil. Permeability is slow. Available water capacity is very low. Runoff is rapid. The shrink-swell potential is high.

All of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is little bluestem and sideoats grama and lesser amounts of western wheatgrass, blue grama, and threadleaf sedge. Overused areas are dominated by sideoats grama and blue grama interspersed with bare spots.

This soil is generally unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings because of the slope, the shallow depth to shale, and the very low available water capacity.

The capability unit is VIIe-8; Shallow range site.

OpB—Opal clay, 2 to 6 percent slopes. This moderately deep, well drained, gently sloping soil is on uplands. When dry, it is characterized by cracks, which are 0.5 inch to 2.0 inches wide and several feet long and extend through the subsoil. Areas are irregular in shape and are 5 to 3,000 acres in size. Slopes are smooth or slightly convex.

Typically, the surface layer is dark gray clay about 4 inches thick. The subsoil is dark gray and gray, firm clay about 17 inches thick. It is calcareous in the lower part. The underlying material is gray, calcareous very shaly clay. Gray shale is at a depth of about 32 inches. In some areas the depth to shale is more than 40 inches.

Included with this soil in mapping are small areas of Hurley and Sansarc soils. These soils make up less than 15 percent of any one mapped area. The moderately well drained Hurley soils have a sodium affected subsoil. They are in low areas. Sansarc soils are 6 to 20 inches deep to shale. They are on short, steep slopes.

Organic matter content is moderate and fertility medium in the Opal soil. Tilth is poor. Permeability is very slow. Available water capacity is low. Runoff is medium. The shrink-swell potential is very high.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of sideoats grama and blue grama. Overused areas are dominated by blue grama and buffalograss.

This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. The soil is subject to surface compaction if tilled when wet and cannot be easily tilled when dry. Measures that control erosion, conserve moisture, and improve tilth are the main management needs in cultivated areas. Leaving crop residue on the surface, minimizing tillage, subsoiling, and including grasses and legumes in the cropping sequence are examples. Stripcropping and field windbreaks help to control wind erosion. Contour farming, grassed waterways, and terraces can help to control water erosion, but the slopes in some areas are too short or too irregular for contouring and terracing.

This soil is suited to windbreaks and environmental plantings; however, it takes in water slowly and the clayey subsoil can restrict the penetration of plant roots. Windbreaks can be established, but optimum growth is unlikely. Planting on the contour helps to control erosion.

The capability unit is IIIe-4; Clayey range site.

OpC—Opal clay, 6 to 9 percent slopes. This moderately deep, well drained, moderately sloping soil is on uplands. When dry, it is characterized by cracks, which are 0.5 inch to 2.0 inches wide and several feet long and extend through the subsoil. Areas are irregular in shape and 5 to 325 acres in size. Slopes are short and convex.

Typically, the surface layer is dark gray clay about 4 inches thick. The subsoil is dark gray and gray, firm clay about 17 inches thick. It is calcareous in the lower part. The underlying material is gray, calcareous very shaly clay. Gray shale is at a depth of about 32 inches. In some areas the depth to shale is more than 40 inches.

Included with this soil in mapping are small areas of Hurley and Sansarc soils. These soils make up less than 15 percent of any one mapped area. The moderately well drained Hurley soils have a sodium affected subsoil. They are on foot slopes. Sansarc soils are 6 to 20 inches deep to shale. They are on short, steep slopes.

Organic matter content is moderate and fertility medium in the Opal soil. Tilth is poor. Permeability is very slow. Available water capacity is low. Runoff is medium. The shrink-swell potential is very high.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of sideoats grama and blue grama. Overused areas are dominated by blue grama and buffalograss.

This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. The soil is subject to surface compaction if tilled when wet and cannot be easily tilled when dry. Measures that control erosion, conserve moisture, and improve tilth are the main management needs in cultivated areas. Leaving crop residue on the surface, chiseling, subsoiling, and including grasses and legumes in the cropping sequence are examples. Stripcropping and field windbreaks help to control wind erosion. Contour farming, grassed waterways, and terraces can help to control water erosion, but the slopes in some areas are too short or too irregular for contouring and terracing.

This soil is suited to windbreaks and environmental plantings; however, it takes in water slowly and the clayey subsoil can restrict the penetration of plant roots. Windbreaks can be established, but optimum growth is unlikely. Planting on the contour helps to control erosion.

The capability unit is IVe-4; Clayey range site.

OsD—Opal-Sansarc clays, 9 to 25 percent slopes. These well drained, strongly sloping and moderately steep soils are on the breaks along Lake Oahe. The moderately deep Opal soil is on side slopes. The shallow Sansarc soil is on ridges and short, steep side slopes along drainageways. Slopes generally are short and convex. Areas are irregular in shape and are 5 to 500 acres in size. They are 50 to 60 percent Opal soil and 25 to 35 percent Sansarc soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Opal soil is dark gray clay about 4 inches thick. The subsoil is dark gray and gray, firm clay about 17 inches thick. It is calcareous in the lower part. The underlying material is gray, calcareous, very shaly clay. Gray shale is at a depth of about 32 inches. In some areas the depth to shale is more than 40 inches.

Typically, the surface layer of the Sansarc soil is olive gray, calcareous clay about 4 inches thick. The next 3 inches is olive gray shaly clay. The underlying material is light olive gray, calcareous shaly clay about 8 inches thick. Light olive gray, calcareous shale is at a depth of about 15 inches. In some areas the soil has a higher content of free carbonates.

Included with these soils in mapping are small areas of the moderately well drained Hurley soils. These soils make up less than 15 percent of any one mapped area. They have a sodium affected subsoil. They are on the lower slopes and in nearly level areas adjacent to drainageways.

Organic matter content is moderate and fertility medium in the Opal soil. Organic matter content and fertility are low in the Sansarc soil. Permeability is very slow in the Opal soil and slow in the Sansarc soil. Available water capacity is low in the Opal soil and very low in the Sansarc soil. Runoff is rapid on both soils. The shrink-swell potential is very high.

Most of the acreage supports native grasses. These soils are suited to range. The native vegetation on the Opal soil dominantly is western wheatgrass and green needlegrass and lesser amounts of sideoats grama and blue grama. That on the Sansarc soil dominantly is little bluestem and western wheatgrass and lesser amounts of blue grama, sideoats grama, and green needlegrass. Overused areas of these soils are dominated by blue grama, sideoats grama, and buffalograss interspersed with bare spots.

These soils generally are unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings because of the slope.

The Opal soil is in capability unit VIe-4, Clayey range site; the Sansarc soil is in capability unit VIe-12, Shallow Clay range site.

Pa—Pits, gravel. These are open excavations, 5 to 30 feet deep, from which sand and gravel are being removed. They are irregular in shape and are 3 to 35 acres in size. Slopes are uneven and broken. They range from nearly level on the pit bottoms to almost vertical on the rims. Some of the pit bottoms are covered with water.

The pit bottoms typically are sand and gravel, but they are loam, clay loam, or silty clay loam glacial till where all of the sand and gravel has been removed. Mounds of mixed loamy overburden are on the edges of the excavations. The bottoms and sides support little or no vegetation during periods when the pits are used.

Most gravel pits are used only as a source of sand and gravel for construction purposes. Some provide limited wildlife habitat. Abandoned gravel pits can be restored to range, tame pasture, or cropland if reclamation measures are applied. These measures include shaping the areas and using the mounds of overburden material as topsoil dressing. Applying fertilizer as needed helps to establish range or pasture plants.

The capability unit is VIIIs-2; no range site is assigned.

Pk—Plankinton silt loam. This deep, poorly drained, level soil is in depressions in the uplands. It is ponded during periods of snowmelt or heavy rainfall. Areas are circular or oblong in shape and are 5 to 100 acres in size.

Typically, the surface layer is dark gray silt loam about 4 inches thick. The subsurface layer is gray silt loam about 3 inches thick. The subsoil is about 32 inches thick. It is dark gray, firm clay in the upper part and firm, calcareous clay loam in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam. In some areas the soil has a sodium affected subsoil and a thinner surface layer.

Included with this soil in mapping are small areas of Tetonka soils. These soils make up less than 15 percent of any one mapped area. Their surface layer is thicker than that of the Plankinton soil. Their positions on the landscape are similar to those of the Plankinton soil.

Organic matter content is moderate and fertility medium in the Plankinton soil. Tilth is poor. Permeability is very slow. Available water capacity is high. A seasonal high water table is within a depth of 1 foot most of the year. As much as 1 foot of water ponds on the surface during some wet periods. Runoff is ponded. The shrink-swell potential is high.

About half of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay, but the ponding is a hazard. Examples of suitable pasture plants are Garrison creeping foxtail and reed canarygrass. Measures that improve drainage, the rate of water intake, and tilth are the main management needs in cultivated areas. Chiseling, subsoiling, including grasses and legumes in the cropping sequence, and installing surface drains are examples.

This soil is suited to range. The native vegetation dominantly is western wheatgrass and lesser amounts of sedges and saltgrass. Overused areas are dominated by buffalograss, saltgrass, and sedges. Many areas are potential sites for excavated ponds.

This soil generally is unsuited to windbreaks and environmental plantings unless it is drained.

The capability unit is IVw-1; Closed Depression range site.

PrA—Promise clay, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on uplands. When dry, it is characterized by cracks, which are 0.5 inch to 2.0 inches wide and several feet long and extend through the subsoil. Areas are irregular in shape and are 5 to 500 acres in size. Slopes are long and smooth.

Typically, the surface layer is dark grayish brown, calcareous clay about 5 inches thick. The subsoil is dark grayish brown and olive gray, firm, calcareous clay about 20 inches thick. The underlying material to a depth of 60 inches is olive gray, calcareous clay. In some areas shale is within a depth of 40 inches.

Included with this soil in mapping are small areas of the moderately well drained Hurley soils. These soils make up less than 10 percent of any one mapped area. They have a sodium affected subsoil. They are in low areas.

Organic matter content is moderate and fertility medium in the Promise soil. Tilth is poor. Permeability is very slow. Available water capacity is low or moderate. Runoff is slow. The shrink-swell potential is very high.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of sideoats grama and blue grama. Overused areas are dominated by blue grama and buffalograss.

This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. The soil is subject to surface compaction if tilled when wet and is not easily tilled when dry. Measures that control wind erosion, conserve moisture, and improve tilth are the main management needs in cultivated areas. Leaving crop residue on the surface, subsoiling, and including grasses and legumes in the cropping sequence are examples. Stripcropping and field windbreaks also can help to control wind erosion.

This soil is suited to windbreaks and environmental plantings; however, it takes in water slowly and the clayey subsoil can restrict the penetration of plant roots. Windbreaks can be established, but optimum growth is unlikely.

The capability unit is IIIs-3; Clayey range site.

PrB—Promise clay, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on uplands. When dry, it is characterized by cracks, which are 0.5 inch to 2.0 inches wide and several feet long and extend through the subsoil. Areas are irregular in shape and are 5 to 100 acres in size. Slopes are long and smooth.

Typically, the surface layer is dark grayish brown, calcareous clay about 5 inches thick. The subsoil is dark grayish brown and olive gray, firm, calcareous clay about 20 inches thick. The underlying material to a depth of 60 inches is olive gray, calcareous clay. In some areas shale is within a depth of 40 inches.

Included with this soil in mapping are small areas of the moderately well drained Hurley soils. These soils make up less than 10 percent of any one mapped area. They have a sodium affected subsoil. They are in low areas.

Organic matter content is moderate and fertility medium in the Promise soil. Tilth is poor. Permeability is very slow. Available water capacity is low or moderate. Runoff is medium. The shrink-swell potential is very high.

Most of the acreage supports native grasses. These soils are suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of sideoats grama and blue grama. Overused areas are dominated by blue grama and buffalograss.

This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. The soil is subject to surface compaction if tilled when wet and cannot be easily tilled when dry. Measures that control erosion, conserve moisture, and improve tilth are the main management needs in cultivated areas. Leaving crop residue on the surface, subsoiling, and including grasses and legumes in the cropping sequence are examples. Stripcropping and field windbreaks can help to control wind erosion. Contour farming, grassed waterways, and terraces help to control water erosion.

This soil is suited to windbreaks and environmental plantings; however, it takes in water slowly and the clayey subsoil can restrict the penetration of plant roots. Windbreaks can be established, but optimum growth is unlikely. Planting on the contour helps to control erosion.

The capability unit is IIIe-4; Clayey range site.

RaA—Raber loam, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on uplands. Scattered stones and boulders are on the surface and throughout the profile. Areas are irregular in shape and are 5 to 180 acres in size. Slopes are long and smooth.

Typically, the surface layer is dark grayish brown loam about 4 inches thick. The subsoil is grayish brown and light brownish gray, firm clay loam about 23 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and pale olive, calcareous clay loam. In places free carbonates are within 12 inches of the surface. In some areas the subsoil contains more clay.

Included with this soil in mapping are small areas of Cavo, Eakin, and Mobridge soils. These soils make up less than 15 percent of any one mapped area. The moderately well drained Cavo soils have a sodium affected subsoil. They are in low areas. Eakin soils contain more silt and less clay in the subsoil than the Raber soil. They are slightly higher on the landscape than the Raber soil. The moderately well drained Mobridge soils have dark colors that extend below a depth of 20 inches. They are in swales.

Organic matter content is moderate and fertility medium in the Raber soil. Tilth is fair. Permeability is moderately slow. Available water capacity is high. Runoff is slow. The shrink-swell potential is high.

Most of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that improve tilth, increase the rate of water intake, and conserve moisture are the main management needs. Examples are leaving crop residue on the surface and minimizing tillage. Subsoiling and including grasses and legumes in the cropping sequence increase the rate of water intake and improve tilth. The scattered surface stones in some areas hinder the use of farm machinery. They should be removed annually.

This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of blue grama. Overused areas are dominated by blue grama.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well.

The capability unit is IIc-2; Clayey range site.

RaB—Raber loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on uplands. Scattered stones and boulders are on the surface and throughout the profile. Areas are irregular in shape and are 5 to 225 acres in size. Slopes are long and smooth.

Typically, the surface layer is dark grayish brown loam about 4 inches thick. The subsoil is grayish brown and light brownish gray, firm clay loam about 23 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and pale olive, calcareous clay loam. In places free carbonates are within 12 inches of the surface. In some areas the subsoil contains more clay.

Included with this soil in mapping are small areas of Cavo, Eakin, and Mobridge soils. These soils make up less than 15 percent of any one mapped area. The moderately well drained Cavo soils have a sodium affected subsoil. They are in low areas. Eakin soils contain more silt and less clay in the subsoil than the Raber soil. They are slightly higher on the landscape than the Raber soil. The moderately well drained Mobridge soils have dark colors that extend below a depth of 20 inches. They are in swales.

Organic matter content is moderate and fertility medium in the Raber soil. Tilth is fair. Permeability is moderately slow. Available water capacity is high. Runoff is medium. The shrink-swell potential is high.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of blue grama. Overused areas are dominated by blue grama.

This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control erosion, improve tilth, increase the rate of water intake, and conserve moisture are the main management needs in cultivated areas. Examples are leaving crop residue on the surface and minimizing tillage. Subsoiling and including grasses and legumes in the cropping sequence increase the rate of water intake and improve tilth. Contour farming, grassed waterways, and terraces help to control erosion, but the slopes in some areas are too short or too irregular for contouring and terracing. The scattered stones in some areas hinder the use of farm machinery. They should be removed annually.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well. Planting the trees and shrubs on the contour helps to control erosion.

The capability unit is IIe-2; Clayey range site.

RcA—Raber-Cavo loams, 0 to 2 percent slopes. These deep, nearly level soils are on uplands. The well drained Raber soil is on slight rises and side slopes. In some areas scattered glacial stones are on the surface and throughout the profile. The moderately well drained Cavo soil is in shallow depressions. Areas are irregular in shape and are 5 to 150 acres in size. They are 50 to 65 percent Raber soil and 25 to 35 percent Cavo soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Raber soil is dark grayish brown loam about 4 inches thick. The subsoil is grayish brown and light brownish gray, firm clay loam about 23 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and pale olive, calcareous clay loam. In places the subsoil contains more clay. In some areas free carbonates are within 12 inches of the surface.

Typically, the surface layer of the Cavo soil is gray loam about 4 inches thick. The subsurface layer is light brownish gray loam about 4 inches thick. The subsoil is about 14 inches thick. It is dark grayish brown and light brownish gray, firm clay and clay loam. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam. In places the subsoil does not have columnar structure.

Included with these soils in mapping are small areas of the moderately well drained Jerauld and Mobridge soils. These included soils make up less than 15 percent of any one mapped area. Jerauld soils have visible salts within a depth of 16 inches. They are in small pits and depressions. Mobridge soils are in swales. They are dark to a depth of more than 20 inches.

Organic matter content is moderate and fertility medium in the Raber and Cavo soils. Tilth is fair in the Raber soil and poor in the Cavo soil. Root penetration is restricted by the dense claypan subsoil and the high content of sodium salts in the Cavo soil. Permeability is moderately slow in the Raber soil. It is very slow in the subsoil of the Cavo soil and moderately slow in the underlying material. Available water capacity is high in the Raber soil and medium in the Cavo soil. Runoff is slow on both soils. The shrink-swell potential is high.

Most of the acreage supports native grasses. These soils are suited to range. Productivity is limited in areas of the Cavo soil, however, because of the dense claypan subsoil. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of blue grama and buffalograss. Overused areas are dominated by blue grama and buffalograss.

These soils are suited to cultivated crops and to tame pasture and hay. The Cavo soil tends to be droughty late in the growing season because of the sodium affected subsoil, which restricts root penetration. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that improve tilth, increase the rate of water intake, and conserve moisture are the main management needs in cultivated areas. Examples are leaving crop residue on the surface and minimizing tillage. Subsoiling and including grasses and legumes in the cropping sequence increase the rate of water intake and improve tilth. The scattered surface stones in some areas of the Raber soil hinder the use of farm machinery. They should be removed annually.

These soils are suited to windbreaks and environmental plantings, but the dense claypan subsoil in the Cavo soil restricts root penetration. Most climatically suited trees and shrubs grow well on the Raber soil, but optimum growth, survival, and vigor cannot be expected on the Cavo soil.

The Raber soil is in capability unit IIc-2, Clayey range site; the Cavo soil is in capability unit IVs-2, Claypan range site.

RcB—Raber-Cavo loams, 2 to 6 percent slopes. These deep, undulating soils are on uplands. The well drained Raber soil is on the higher lying side slopes and ridges. In some areas scattered glacial stones are on the surface and throughout the profile. The moderately well drained Cavo soil is on the lower side slopes and in shallow depressions. Slopes are smooth or slightly convex. Areas are irregular in shape and are 5 to 160 acres in size. They are 50 to 65 percent Raber soil and 25 to 35 percent Cavo soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Raber soil is dark grayish brown loam about 4 inches thick. The subsoil is grayish brown and light brownish gray, firm clay loam about 23 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and pale olive, calcareous clay loam. In places the subsoil contains more clay. In some areas free carbonates are within 12 inches of the surface.

Typically, the surface layer of the Cavo soil is gray loam about 4 inches thick. The subsurface layer is light brownish gray loam about 4 inches thick. The subsoil is about 14 inches thick. It is dark grayish brown and light brownish gray, firm clay and clay loam. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray, calcareous clay loam. In places the subsoil does not have columnar structure.

Included with these soils in mapping are small areas of Jerauld and Mobridge soils. These included soils make up less than 15 percent of any one mapped area. Jerauld soils have visible salts within a depth of 16 inches. They are in small pits and depressions. The moderately well drained Mobridge soils are in swales. They are dark to a depth of more than 20 inches.

Organic matter content is moderate and fertility medium in the Raber and Cavo soils. Tilth is fair in the Raber soil and poor in the Cavo soil. Root penetration is restricted by the dense claypan subsoil and the high content of sodium salts in the Cavo soil. Permeability is moderately slow in the Raber soil. It is very slow in the subsoil of the Cavo soil and moderately slow in the underlying material. Available water capacity is high in the Raber soil and medium in the Cavo soil. Runoff is medium on both soils. The shrink-swell potential is high.

Most of the acreage supports native grasses. These soils are suited to range. Productivity is limited in areas of the Cavo soil, however, because of the dense claypan subsoil. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of blue grama and buffalograss. Overused areas are dominated by blue grama and buffalograss.

These soils are suited to cultivated crops and to tame pasture and hay. The Cavo soil tends to be droughty late in the growing season because of the sodium affected subsoil, which restricts root penetration. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control erosion, improve tilth, increase the rate of water intake, and conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples. Subsoiling and including grasses and legumes in the cropping sequence increase the rate of water intake and improve tilth. Contour farming, grassed waterways, and terraces help to control erosion, but slopes in some areas are too short or too irregular for contouring and terracing. The scattered surface stones in some areas of the Raber soil hinder the use of farm machinery. They should be removed annually.

These soils are suited to windbreaks and environmental plantings, but the dense claypan subsoil in the Cavo soil restricts root penetration. Most climatically suited trees and shrubs grow well on the Raber soil, but optimum growth, survival, and vigor cannot be expected on the Cavo soil.

The Raber soil is in capability unit IIe-2, Clayey range site; the Cavo soil is in capability unit IVs-3, Claypan range site.

RgD—Raber-Gettys complex, 9 to 25 percent slopes. These deep, well drained, strongly sloping and moderately steep soils are on ridges and side slopes along drainageways in the uplands. The Raber soil is on the mid and lower side slopes. The Gettys soil is on the upper side slopes and on ridges. Scattered stones are on the surface in most areas. Areas are long and narrow and are 5 to 175 acres in size. They are 60 to 70 percent Raber soil and 25 to 35 percent Gettys soil. These two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Raber soil is dark grayish brown loam about 4 inches thick. The subsoil is grayish brown and light brownish gray, firm clay loam about 23 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and pale olive, calcareous clay loam. In places free carbonates are within 10 inches of the surface. In some areas the subsoil contains more clay.

Typically, the surface layer of the Gettys soil is dark grayish brown clay loam about 3 inches thick. The underlying material to a depth of 60 inches is grayish brown and olive, calcareous clay loam. In some areas the soil contains less clay.

Included with these soils in mapping are small areas of Sansarc and Schamber soils. These included soils make up less than 10 percent of any one mapped area. Sansarc soils are 4 to 20 inches deep to shale. They are lower on the landscape than the Raber and Gettys soils. The excessively drained Schamber soils are less than 10 inches deep to very gravelly sand. They are on ridges.

Organic matter content is moderate and fertility medium in the Raber soil. Organic matter content and fertility are low in the Gettys soil. Tilth is fair in both soils. Permeability is moderately slow. Available water capacity is high in the Raber soil and moderate in the Gettys soil. Runoff is medium or rapid on both soils. The shrink-swell potential is high.

Most of the acreage supports native grasses. These soils are suited to range. The native vegetation on the Raber soil dominantly is western wheatgrass and green needlegrass and lesser amounts of blue grama. That on the Gettys soil dominantly is little bluestem and lesser amounts of sideoats grama, western wheatgrass, and threadleaf sedge. Overused areas of the Raber soil are dominated by blue grama. Overused areas of the Gettys soil are dominated by sideoats grama and threadleaf sedge interspersed with bare spots.

This map unit is suited to cultivated crops; however, no crops grow well on the Gettys soil. Measures that control erosion, improve tilth, increase the rate of water intake, and conserve moisture are the main management needs in cultivated areas. Examples are leaving crop residue on the surface, subsoiling, and including grasses and legumes in the cropping sequence. Contour farming, grassed waterways, and terraces help to control water erosion, but the slopes in some areas are too short or too irregular for contouring and terracing. The scattered surface stones in most areas hinder the use of farm machinery. They should be removed annually.

These soils are suited to tame pasture and hay. Alfalfa, intermediate wheatgrass, and smooth bromegrass are suitable pasture plants.

This map unit is suited to windbreaks and environmental plantings. Most climatically suited trees and shrubs grow well on the Raber soil, but optimum growth, survival, and vigor cannot be expected on the Gettys soil. Planting on the contour helps to control erosion.

The Raber soil is in capability unit IVe-1, Clayey range site; the Gettys soil is in capability unit VIe-3, Thin Upland range site.

RhC—Raber-Peno loams, 6 to 9 percent slopes. These deep, well drained, gently rolling soils are on uplands. The Raber soil is on side slopes. The Peno soil is on ridges. Scattered stones and boulders are on the surface and throughout both soils. Areas are irregular in shape and are 5 to 700 acres in size. They are 50 to 60 percent Raber soil and 30 to 35 percent Peno soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface layer of the Raber soil is dark grayish brown loam about 4 inches thick. The subsoil is grayish brown and light brownish gray, firm clay loam about 23 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and pale olive, calcareous clay loam. In places the subsoil contains more clay.

Typically, the surface layer of the Peno soil is dark grayish brown loam about 4 inches thick. The subsoil is dark grayish brown and grayish brown, firm clay loam about 11 inches thick. It is calcareous in the lower part. The underlying material to a depth of 60 inches is light brownish gray and grayish brown, calcareous clay loam.

Included with these soils in mapping are small areas of Cavo, Eakin, Gettys, and Mobridge soils. These included soils make up less than 20 percent of any one mapped area. The moderately well drained Cavo soils have a sodium affected subsoil. They are in slight depressions. Eakin soils contain more silt and less clay in the subsoil than the Raber and Peno soils. They are on ridges. The stony Gettys soils contain free carbonates at or near the surface. They are on short, steep slopes. The moderately well drained Mobridge soils are in swales.

Organic matter content is moderate and fertility medium in the Raber and Peno soils. Tilth is fair. Permeability is moderately slow. Available water capacity is high. Runoff is medium. The shrink-swell potential is high.

Most of the acreage supports native grasses. These soils are suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of blue grama. Overused areas are dominated by blue grama.

These soils are suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that control erosion, increase the rate of water intake, and conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface, minimizing tillage, subsoiling, and including grasses and legumes in the cropping sequence are examples. Contour farming, grassed waterways, and terraces help to control erosion, but the slopes in some areas are too short or too irregular for contouring and terracing. The scattered surface stones hinder the use of farm machinery. They should be removed annually.

These soils are suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, most climatically suited trees and shrubs grow well. Planting on the contour helps to control erosion.

The Raber soil is in capability unit IIIe-2, the Peno soil in capability unit IVe-3; both soils are in the Clayey range site.

Rn—Ranslo silt loam. This deep, somewhat poorly drained, nearly level soil is on flood plains. It is occasionally flooded for very brief periods. Areas are irregular in shape or long and narrow and are 5 to 100 acres in size. Slopes are smooth.

Typically, the surface soil is dark gray silt loam about 9 inches thick. The subsoil is dark gray and dark grayish brown, firm clay loam about 16 inches thick. The upper 19 inches of the underlying material is grayish brown, calcareous clay loam. The lower part to a depth of 60 inches is light yellowish brown, calcareous sandy clay loam.

Included with this soil in mapping are small areas of Durrstein and Regan soils. These soils make up less than 15 percent of any one mapped area. The poorly drained Durrstein soils have visible salts within a depth of 15 inches. They are slightly lower on the landscape than the Ranslo soil. The very poorly drained Regan soils do not have a sodium affected subsoil. They are in positions on the landscape similar to those of the Ranslo soil.

Organic matter content and fertility are high in the Ranslo soil. Tilth is fair. The sodium affected subsoil restricts root penetration. Permeability is slow. Available water capacity is high. A seasonal high water table is at a depth of 1 to 3 feet most of the year. Runoff is slow. The shrink-swell potential is high.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is big bluestem and lesser amounts of western wheatgrass and switchgrass. Overused areas are dominated by western wheatgrass, saltgrass, and Kentucky bluegrass.

This soil is suited to cultivated crops and to tame pasture and hay, but the flooding and the sodium affected subsoil are limitations. Examples of suitable pasture plants are alfalfa, Garrison creeping foxtail, intermediate wheatgrass, and reed canarygrass. Measures that control the flooding, improve tilth, and increase the rate of water intake are the main management needs in cultivated areas. Examples are providing artificial drainage, subsoiling, and including grasses and legumes in the cropping sequence.

This soil is suited to windbreaks and environmental plantings. If surface drains are installed, all climatically suited trees and shrubs grow well. Those that require an abundant supply of moisture grow especially well.

The capability unit is IIIw-4; Subirrigated range site.

Rr—Ranslo-Durrstein silt loams. These deep, nearly level soils are on flood plains. They are occasionally flooded. The somewhat poorly drained Ranslo soil is on slight rises. The poorly drained Durrstein soil is in slight depressions. Areas are irregular in shape and are 5 to 350 acres in size. They are 55 to 65 percent Ranslo soil and 25 to 30 percent Durrstein soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the surface soil of the Ranslo soil is dark gray silt loam about 9 inches thick. The subsoil is dark gray and dark grayish brown, firm clay loam about 16 inches thick. The upper 19 inches of the underlying material is grayish brown, calcareous clay loam. The lower part to a depth of 60 inches is light yellowish brown, calcareous sandy clay loam.

Typically, the surface layer of the Durrstein soil is grayish brown silt loam about 2 inches thick. The subsoil is dark gray and grayish brown, firm clay about 13 inches thick. The underlying material to a depth of 60 inches is grayish brown and light brownish gray, calcareous clay loam. It is mottled in the lower part.

Included with these soils in mapping are small areas of the very poorly drained Regan soils. These soils do not have a sodium affected subsoil. They are in positions on the landscape similar to those of the Ranslo soil.

Organic matter content and fertility are high in the Ranslo soil. Organic matter content and fertility are low in the Durrstein soil. The sodium in both soils adversely affects the growth of most plants. Tilth is fair in the Ranslo soil and poor in the Durrstein soil. Permeability is slow in the Ranslo soil and very slow in the Durrstein soil. Available water capacity is high in the Ranslo soil and moderate in the Durrstein soil. A seasonal high water table is at a depth of 1.0 to 3.0 feet in the Ranslo soil and within a depth of 1.5 feet in the Durrstein soil most of the year. Runoff is slow on both soils. The shrink-swell potential is high.

Most of the acreage supports native grasses. These soils are suited to range. The native vegetation on the Ranslo soil dominantly is big bluestem and lesser amounts of switchgrass and western wheatgrass. That on the Durrstein soil dominantly is western wheatgrass, Nuttall alkaligrass, and saltgrass. Overused areas of the Ranslo soil are dominated by western wheatgrass, saltgrass, and Kentucky bluegrass. Overused areas of the Durrstein soil are dominated by saltgrass and weeds interspersed with bare spots.

This map unit is suited to cultivated crops and to tame pasture and hay, but productivity is severely limited in areas of the Durrstein soil because of the dense claypan subsoil and the high content of salts in the subsoil. Examples of suitable pasture plants are alfalfa, Garrison creeping foxtail, intermediate wheatgrass, and reed canarygrass. The main management concerns in cultivated areas are controlling wetness in the spring and after heavy rains and improving tilth. Providing artificial drainage helps to remove excess water. Subsoiling and including grasses and legumes in the cropping sequence help to improve tilth.

The Ranslo soil is suited to windbreaks and environmental plantings, but the Durrstein soil generally is unsuited. If surface drains are installed, all climatically suited trees and shrubs grow well on the Ranslo soil. Those that require an abundant moisture supply grow especially well. The dense claypan subsoil and the high content of salts in the subsoil severely limit the growth of trees and shrubs on the Durrstein soil.

The Ranslo soil is in capability subclass IIIw-4, Subirrigated range site; the Durrstein soil is in capability subclass VIw-4, Saline Lowland range site.

RsA—Ree loam, 0 to 2 percent slopes. This deep, well drained, nearly level soil is on terraces. Areas are irregular in shape and are 5 to 400 acres in size. Slopes generally are long and smooth.

Typically, the surface layer is dark grayish brown loam about 7 inches thick. The subsoil is grayish brown, friable clay loam about 16 inches thick. The upper 27 inches of the underlying material is light brownish gray, calcareous clay loam. The lower part to a depth of 60 inches is multicolored gravelly sand. In some areas the depth to gravelly material is less than 40 or more than 60 inches.

Included with this soil in mapping are small areas of the moderately well drained Mobridge soils in swales. These soils make up less than 10 percent of any one mapped area.

Organic matter content is moderate and fertility medium in the Ree soil. Tilth is good. Permeability is moderate. Available water capacity is high. Runoff is slow. The shrink-swell potential is moderate.

Most of the acreage is cropland. This soil is well suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that conserve moisture are the main management needs in cultivated areas. Leaving crop residue on the surface and minimizing tillage are examples. The soil is suited to irrigation.

This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of needleandthread and blue grama. Overused areas are dominated by blue grama and Kentucky bluegrass.

These soils are suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, all climatically suited trees and shrubs grow well.

The capability unit is IIc-2; Silty range site.

Rt—Regan silt loam. This deep, very poorly drained, nearly level soil is on flood plains, in valleys, and in outwash channels. It is frequently flooded. Areas are irregular in shape and are 5 to 150 acres in size. Slopes generally are smooth or slightly concave.

Typically, the surface layer is grayish brown silt loam about 7 inches thick. The underlying material to a depth of 60 inches is gray and light gray, calcareous silt loam.

Included with this soil in mapping are small areas of Durrstein, Oahe, Ranslo, and Worthing soils. These soils make up less than 15 percent of any one mapped area. The poorly drained Durrstein soils and somewhat poorly drained Ranslo soils have a sodium affected subsoil. They are in positions on the landscape similar to those of the Regan soil. The well drained Oahe soils are 20 to 40 inches deep to gravelly material. They are slightly higher on the landscape than the Regan soil. Worthing soils contain more clay and have a lower content of free carbonates throughout than the Regan soil. They are in depressions.

Organic matter content is moderate and fertility medium in the Regan soil. Permeability is moderate. Available water capacity is high. A seasonal high water table is within a depth of 1 foot during wet periods. Runoff is slow. The shrink-swell potential is moderate.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is rivergrass and slough sedge and lesser amounts of prairie cordgrass. Overused areas are dominated by sedges, rushes, and saltgrass.

This soil is suited to tame pasture and hay; however, the high water table is a limitation. The number of suitable species is limited because natural drainage is not adequate and artificial drainage is not feasible. Garrison creeping foxtail and reed canarygrass are suitable.

This soil generally is unsuited to cultivated crops and to windbreaks and environmental plantings because the water table is at or near the surface most of the year.

The capability unit is Vw-4; Wetland range site.

SaF—Sansarc clay, 15 to 40 percent slopes. This shallow, well drained, moderately steep and steep soil is on the breaks along Lake Oahe. Areas are irregular in shape and are 5 to 2,500 acres in size. Slopes are short and slightly convex.

Typically, the surface layer is olive gray, calcareous clay about 4 inches thick. The next 3 inches is olive gray, calcareous shaly clay. The underlying material is light olive gray, calcareous shaly clay. Light olive gray, calcareous shale is at a depth of about 15 inches. In some areas the soil has a higher content of free carbonates.

Included with this soil in mapping are small areas of Hurley, Opal, and Promise soils. These soils make up less than 20 percent of any one mapped area. The moderately well drained Hurley soils have a sodium affected subsoil. They are in the nearly level areas along drainageways. Opal soils are 20 to 40 inches deep to shale. They are in the less sloping areas. Promise soils are more than 40 inches deep to shale. They are on foot slopes. Also included is a deep, silty soil on ridges.

Organic matter content and fertility are low in the Sansarc soil. Permeability is slow. Available water capacity is very low. Runoff is rapid. The shrink-swell potential is very high.

All of the acreage is rangeland. This soil is suited to range. The native vegetation dominantly is little bluestem and western wheatgrass and lesser amounts of blue grama, sideoats grama, and green needlegrass. Overused areas are dominated by blue grama and sideoats grama interspersed with bare spots.

This soil generally is unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings because of the slope, the shallow depth to shale, and the very low available water capacity.

The capability unit is VIIe-8; Shallow Clay range site.

ScF—Schamber gravelly loam, 15 to 60 percent slopes. This excessively drained, hilly to very steep soil is on uplands. It is very shallow over very gravelly sand. Gravel pits are in some areas. Areas are irregular in shape and are 5 to 350 acres in size. Slopes are short and convex.

Typically, the surface layer is dark grayish brown gravelly loam about 4 inches thick. The underlying material to a depth of 60 inches is multicolored, calcareous very gravelly sand.

Included with this soil in mapping are small areas of Betts, Delmont, Java, and Lowry soils. These soils make up less than 25 percent of any one mapped area. The well drained Betts and Java soils formed in clay loam glacial till and are not underlain by sand and gravel. They are on the less sloping parts of the landscape. The somewhat excessively drained Delmont soils have sand and gravel at a depth of 14 to 20 inches. They are on side slopes below the Schamber soil. The well drained Lowry soils formed in loess and are more than 40 inches deep to sand and gravel. They are on smooth side slopes and some ridges above the Schamber soil.

Organic matter content and fertility are low in the Schamber soil. Permeability is rapid. Available water capacity is low. Runoff is slow.

Most of the acreage supports native grasses. This soil is suited to range, but productivity is limited because the soil is droughty. The native vegetation dominantly is needleandthread and blue grama and lesser amounts of threadleaf sedge. Overused areas are dominated by threadleaf sedge, blue grama, and weeds.

This soil is unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings because of the slope and the droughtiness, which is caused by the very shallow depth to sand and gravel. In some areas gravel is mined and used for road construction.

The capability unit is VIIs-4; Very Shallow range site.

Te—Tetonka silt loam. This deep, poorly drained, level soil is in depressions in the uplands. It is ponded during periods of snowmelt or heavy rainfall. Areas are circular or oblong and are 5 to 100 acres in size.

Typically, the surface layer is dark gray silt loam about 7 inches thick. The subsurface layer is light gray and gray silt loam about 7 inches thick. The subsoil is about 33 inches thick. It is dark gray, firm silty clay loam in the upper part and grayish brown, firm clay in the lower part. The underlying material to a depth of 60 inches is light brownish gray clay loam. In some areas the soil does not have a gray subsurface layer.

Included with this soil in mapping are small areas of Hoven and Plankinton soils. These soils make up less than 20 percent of any one mapped area. Hoven soils have a sodium affected subsoil. Hoven and Plankinton soils have a surface layer that is thinner than that of the Tetonka soil. They are in positions on the landscape similar to those of the Tetonka soil.

Organic matter content is moderate and fertility medium in the Tetonka soil. Tilth is good. Permeability is very slow. Available water capacity is high. A seasonal high water table is within a depth of 1 foot most of the year. As much as 1 foot of water ponds on the surface during some wet periods. Runoff is ponded. The shrink-swell potential is high.

About half of the acreage is cropland. This soil is suited to cultivated crops and to tame pasture and hay, but the wetness is a limitation. Examples of suitable pasture plants are Garrison creeping foxtail and reed canarygrass. Measures that improve drainage are the main management needs in cultivated areas. Installing surface drains helps remove the excess water.

This soil is suited to range. The native vegetation dominantly is sedges, prairie cordgrass, and reed grasses and lesser amounts of western wheatgrass. Overused areas are dominated by less palatable sedges and rushes. Many areas are potential sites for excavated ponds.

This soil generally is unsuited to windbreaks and environmental plantings unless it is drained.

The capability unit is IVw-1; Wet Meadow range site.

Wa—Walke silt loam. This deep, moderately well drained, nearly level soil is on uplands. Areas are irregular in shape and are 5 to 250 acres in size. Slopes are smooth.

Typically, the surface soil is dark grayish brown silt loam about 8 inches thick. The next 3 inches is grayish brown and light gray silty clay loam. The subsoil is dark grayish brown and light brownish gray, firm silty clay loam about 16 inches thick. The underlying material to a depth of 60 inches is light brownish gray and brown, calcareous silty clay loam. In places the soil has columnar structure in the subsoil.

Included with this soil in mapping are small areas of Agar, Highmore, Hoven, and Mobridge soils. These soils make up less than 20 percent of any one mapped area. The well drained Agar and Highmore soils are on slight rises. The poorly drained Hoven soils are in depressions. Mobridge soils do not have a sodium affected subsoil. They are in swales.

Organic matter content is moderate and fertility medium in the Walke soil. Tilth is fair. Permeability is moderately slow. Available water capacity is high. Runoff is slow. The shrink-swell potential is high.

Most of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is western wheatgrass and green needlegrass and lesser amounts of blue grama. Overused areas are dominated by blue grama.

This soil is suited to cultivated crops and to tame pasture and hay. Examples of suitable pasture plants are alfalfa, intermediate wheatgrass, and smooth bromegrass. Measures that improve tilth, increase the rate of water intake, and conserve moisture are the main management needs in cultivated areas. Examples are leaving crop residue on the surface, minimizing tillage, and including grasses and legumes in the cropping sequence. Subsoiling helps to break up the claypan subsoil and increases the rate of water intake for a short time.

This soil is suited to windbreaks and environmental plantings. Except for those species that require an abundant supply of moisture, most climatically suited trees and shrubs grow well.

The capability unit is IIIs-1; Clayey range site.

Wf—Wendte silty clay loam, channeled. This deep, moderately well drained, nearly level soil is on flood plains that are dissected into many small tracts by narrow stream channels and partly filled old stream meanders. The soil is frequently flooded. Areas are long and narrow and are 5 to 300 acres in size.

Typically, the surface layer is dark gray silty clay loam about 5 inches thick. The underlying material to a depth of 60 inches is dark gray and gray, calcareous clay loam, silty clay, and silty clay loam stratified with thin layers of sand and gravel.

Included with this soil in mapping are small areas of Durrstein and Hurley soils. These soils make up less than 15 percent of any one mapped area. The poorly drained Durrstein soils and the Hurley soils have a sodium affected subsoil. They are slightly lower on the landscape than the Wendte soil.

Organic matter content is moderate and fertility medium in the Wendte soil. Tilth is poor. Permeability is slow. Available water capacity is moderate. Runoff is slow. The shrink-swell potential is high.

All of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is western wheatgrass, green needlegrass, and blue grama. Overused areas are dominated by western wheatgrass and blue grama.

This soil is generally unsuited to cultivated crops and to tame pasture and hay because of the flooding and the small size of the tracts. It is suited to windbreaks and environmental plantings. The trees and shrubs that require an abundant supply of moisture grow especially well. Because of the meandering stream channels, trees and shrubs generally cannot be planted by machine. They can be planted by hand.

The capability unit is VIw-1; Clayey Overflow range site.

Wo—Worthing silty clay loam. This deep, very poorly drained, level soil is in depressions in the uplands. It is ponded during periods of snowmelt or heavy rainfall. Areas are circular or oblong and are 5 to 900 acres in size.

Typically, the surface layer is dark gray silty clay loam about 9 inches thick. The subsoil is about 47 inches thick. It is dark gray and gray, firm clay and silty clay. The underlying material is grayish brown, calcareous silty clay. In some areas the soil has a gray subsurface layer.

Included with this soil in mapping are small areas of the poorly drained Hoven soils. These soils make up less than 10 percent of any one mapped area. They are in positions on the landscape similar to those of the Worthing soil.

Organic matter content and fertility are high in the Worthing soil. Permeability is slow. Available water capacity is high. A seasonal high water table is within a depth of 1 foot most of the year. As much as 1 foot of water ponds on the surface during some wet periods. Runoff is ponded. The shrink-swell potential is high.

All of the acreage supports native grasses. This soil is suited to range. The native vegetation dominantly is rivergrass and slough sedge and lesser amounts of prairie cordgrass and reed grasses. Overused areas are dominated by less palatable sedges and bulrushes. Many areas are potential sites for excavated ponds.

This soil is generally unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings because of the wetness and ponding. The number of suitable crops and pasture plants is severely limited. Garrison creeping foxtail and reed canarygrass are the best suited pasture plants.

The capability unit is Vw-4; Shallow Marsh range site.

Wp—Worthing silty clay loam, ponded. This deep, very poorly drained, level soil is in depressions in the uplands. It is ponded most of the year. Areas are circular or oblong and are 5 to 75 acres in size.

Typically, the surface layer is dark gray silty clay loam about 9 inches thick. The subsoil is about 47 inches thick. It is dark gray and gray, firm clay and silty clay. The underlying material is grayish brown, calcareous silty clay. In places the soil has a gray subsurface layer.

Organic matter content and fertility are high. Permeability is slow. Available water capacity is high. A seasonal high water table is within a depth of 0.5 foot most of the year. As much as 3.0 feet of water ponds on the surface during some wet periods. Runoff is ponded. The shrink-swell potential is high.

Most areas support native vegetation and are used as wetland wildlife habitat. The natural plant cover is a luxuriant stand of cattails, bulrush, reedgrass, and sedges. Many areas are potential sites for excavated ponds.

This soil is unsuited to cultivated crops, tame pasture and hay, and windbreaks and environmental plantings because of the ponding.

The capability unit is VIIIw-1; no range site is assigned.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban and built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil economically to produce a sustained high yield of crops. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Soil Conservation Service.

About 29,880 acres in Potter County, or 5 percent of the total land area, meets the soil requirements for prime farmland. About 4,000 acres of this land is irrigated. Most of the acreage of these soils is cropland. The main crops are corn, small grain, and alfalfa.

The map units in Potter County that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

As is indicated in parentheses after some of the soil names in table 5, nearly all of the soils listed in the table meet the requirements for prime farmland only if they are irrigated. Onsite investigation is needed to determine whether or not the soils are irrigated.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

James M. Ridler, district conservationist, Soil Conservation Service, helped write this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils are identified, the system of land capability classification used by the Soil Conservation Service is explained, and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

About 62 percent of the acreage in Potter County is used for crops or for tame pasture and hay (*3*). The major crops are wheat, alfalfa, corn, and oats. Sunflower, barley, flax, and rye also are grown. Winter wheat is grown for grain. Alfalfa is harvested mainly for hay. Corn is harvested for both grain and silage. Oats is grown as a cash crop or as livestock feed.

The potential of the soils in Potter County for increased crop production is good. About 60,000 acres of potentially good cropland is currently used as rangeland, 27,000 acres as pasture, and 16,000 acres as tame hayland (*11*). Food production could also be increased considerably by extending the latest crop production technology to all cropland in the county. This soil survey can greatly facilitate the application of such technology. The paragraphs that follow describe the management needed on the cropland in the county.

Water erosion reduces productivity. It is a hazard on Agar, Glenham, Lowry, Opal, and other soils if the slope is more than 2 percent. Productivity is reduced when the more fertile surface layer is lost and part of the subsoil is incorporated into a plow layer. Loss of the surface layer is especially damaging on soils that have a thin surface layer, such as Java and Peno soils. Erosion also reduces the productivity of soils that tend to be droughty, such as Delmont soils. When erosion occurs, sediment rich in nutrients enters streams and lakes. Measures that control erosion minimize the pollution of streams and lakes by sediment and preserve water quality for fish and wildlife, recreation, and municipal use. They also reduce the amount of fertilizer needed in cropped areas and prevent the removal of plant nutrients.

A cropping sequence that keeps a plant cover on the surface for extended periods holds soil losses to an amount that does not reduce the productive capacity of the soils. If a plant cover cannot protect the soil, careful management of crop residue is essential. Minimizing tillage and leaving crop residue on the surface increase the infiltration rate, reduce the runoff rate, and help to control erosion.

Terraces and diversions reduce the length of slopes and the runoff rate and help to control erosion. They are most practical on deep, well drained soils that have long, smooth slopes, such as Agar, Highmore, Lowry, and Promise soils. These soils are well suited to contour farming and contour stripcropping. Many of the other soils in the county are less suitable for terraces and diversions because of short, irregular slopes or an unfavorable subsoil that would be exposed in terrace channels.

Wind erosion is a slight to moderate hazard on many of the soils in the county. The hazard is greatest on the clayey Opal and Promise soils and the soils that have a high content of lime in their surface layer, such as Betts and Davison. Wind erosion can damage these soils in a few hours if winds are strong and the soils are dry and are not protected by a plant cover or surface mulch. An adequate plant cover, a cover of crop residue, stripcropping, and a rough surface help to control wind erosion. Windbreaks of suitable trees and shrubs also are effective in controlling wind erosion.

Information about the measures that control erosion on each kind of soil is contained in the Technical Guide, available in the local office of the Soil Conservation Service.

Soil fertility helps to determine the yields that can be obtained. It can be improved by applying fertilizer and including grasses and legumes in the cropping sequence. In soils that have a high content of lime in the surface layer after cultivation, such as Davison, Java, and Peno soils, the kinds and amounts of fertilizer needed generally differ from the kinds and amounts needed on soils that do not have lime in the surface layer. On all soils additions of fertilizer should be based on the results of soil tests, on the need of the crop, and on the expected yield level. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer needed.

Soil tilth is an important factor in the germination of seeds and in the infiltration of water into the soil. Soils with good tilth are granular and porous. Tilth is poor in clayey soils, such as Opal and Promise. These soils dry out slowly in the spring and cannot be easily tilled when dry. If they are farmed when wet, they tend to be very cloddy when dry. Because of the cloddiness, preparing a good seedbed is difficult. Timely tillage, inclusion of grasses and legumes in the cropping sequence, and incorporation of crop residue into the soil improve tilth and increase the rate of water intake.

Field crops suited to the soils and climate of the survey area include small grain and row crops. Winter wheat, spring wheat, and oats are the main small grain crops. Barley, rye, and flax are grown on a lesser acreage. Corn is the main row crop. Some of it is harvested for silage. Sunflowers and sorghum also are grown. Winter wheat is usually grown after summer fallow.

All commonly grown and climatically adapted crops are suited to deep, well drained and moderately well drained soils, such as Agar, Glenham, Highmore, Lowry, Mobridge, Prosper, and Raber soils. Delmont and Oahe soils are shallow or moderately deep over sand and gravel and are droughty. They are better suited to early maturing small grain than to deeper rooted crops, such as corn and alfalfa. Clayey soils, such as Opal and Promise, are better suited to winter wheat, spring wheat, other small grains, and alfalfa than to row crops.

Many of the deep, well drained soils are suited to irrigation. Examples are Agar, Glenham, Highmore, Lowry, Oahe, and Ree soils. The main concerns of management are conserving moisture and improving fertility and tilth in all of these soils and controlling erosion on the soils that have a slope of more than 2 percent. The quality of irrigation water is a concern. The best water has a low content of salts and sodium.

Pasture plants best suited to the climate and to most of the soils in the survey area include alfalfa, intermediate wheatgrass, and smooth bromegrass. Crested wheatgrass is well suited to soils that tend to be droughty, such as Delmont and Oahe. Bunchgrasses, such as crested wheatgrass and Russian wildrye, should not be planted in areas where the slope is more than 6 percent. Pubescent wheatgrass is suited to DeGrey and other soils that have a dense claypan subsoil.

On the poorly drained Hoven, Plankinton, and Tetonka soils and the very poorly drained Worthing soils, the choice of pasture plants is limited to water-tolerant species, such as Garrison creeping foxtail and reed canarygrass.

If the pasture is overgrazed, the grasses lose vigor and die and are usually replaced by less palatable species, annual grasses, and weeds. Proper stocking rates, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in table 6.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit (*8*). These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-2 or IIIe-6. The capability units are not numbered consecutively because not all of the units in the statewide system are represented in the county.

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in table 6.

Rangeland

James M. Ridler, district conservationist, Soil Conservation Service, helped write this section.

About 35 percent of the acreage of Potter County is rangeland. More than half of the local farm income is derived from the sale of livestock, principally cattle. Cow-calf enterprises are dominant throughout the county. On a few farms, a small number of cattle are fed until they are ready for market.

Most of the rangeland occurs as areas of the Betts-Gettys, Sansarc, and Java-Betts-Glenham associations, which are described under the heading "General Soil Map Units." Scattered small tracts also occur throughout the county. On many farms the forage produced on rangeland is supplemented by crop aftermath. In winter it is supplemented by protein concentrate.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Table 7 shows, for nearly all the soils, the range site and the total potential annual production of vegetation in favorable, average, and unfavorable years. Only those soils that are used as rangeland or are suited to use as rangeland are listed. An explanation of the column headings in table 7 follows.

A *range site* is a distinctive kind of rangeland that produces a characteristic natural plant community that differs from natural plant communities on other range sites in kind, amount, and proportion of range plants. The relationship between soils and vegetation was ascertained during this survey; thus, range sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important.

Most of the rangeland in Potter County is in the Silty range site. The rest is in the Clayey, Clayey Overflow, Claypan, Closed Depression, Limy Subirrigated, Overflow, Saline Lowland, Shallow, Shallow Clay, Shallow Marsh, Shallow to Gravel, Subirrigated, Thin Claypan, Thin Upland, Very Shallow, Wetland, and Wet Meadow range sites.

Potential annual production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, average, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Yields are adjusted to a common percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as exposure, amount of shade, recent rains, and unseasonable dry periods.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition. Range condition is an ecological rating only. It does not have a specific meaning that pertains to the present plant community in a given use.

The native vegetation in most parts of the county has been greatly depleted by continued excessive use. The amount of forage produced may be less than half of that originally produced. Productivity of the range can be increased by applying management that is effective on specific soils and range sites.

An adequate plant cover and ground mulch help to control erosion and increase the moisture supply by reducing the runoff rate. If the range is overgrazed, the more desirable tall grasses lose vigor and are replaced by less productive short grasses. Measures that prevent overgrazing help to keep the range in good condition. Crossfencing and properly distributed watering and salting facilities help to obtain a uniform distribution of grazing.

At the end of each description under the heading "Detailed Soil Map Units," the soil or soils are assigned to an appropriate range site according to the kind and amount of vegetation that is grown on the soil when the site supports the potential natural plant community. The descriptions and interpretations for each range site in the county are in the Technical Guide, which is available in the local office of the Soil Conservation Service.

Native Woods and Windbreaks and Environmental Plantings

James M. Ridler, district conservationist, Soil Conservation Service, helped write this section.

Native trees and shrubs grow on only about 4,200 acres in Potter County (*9*). They generally grow near the margins of natural lakes and wetlands and on the breaks and along the drainageways near Lake Oahe. The early settlers used the native trees and shrubs for fuel and their fruit as a food supply. Today, the trees and shrubs are used mainly for wildlife habitat.

American elm, American plum, boxelder, bur oak, common chokecherry, green ash, silver buffaloberry, skunkbush sumac, western snowberry, and several species of wild rose grow on the Betts, Gettys, Opal, Promise, and Sansarc soils along the drainageways adjacent to Lake Oahe. American plum, peachleaf willow, plains cottonwood, sandbar willow, and western snowberry are common on the margins of lakes, wetlands, and drainageways.

Windbreaks have been planted since the days of the early settlers. The early plantings were made to protect farmsteads and livestock. These kinds of windbreaks are still needed. In recent years field windbreaks have been planted to help control erosion. They are still needed in many areas.

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 8 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 8 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens.

Grazing is detrimental to windbreaks and environmental plantings because the livestock compact the soil and remove the lower branches and bark of the trees and shrubs. The compaction inhibits the infiltration of moisture and retards growth. Removal of the lower branches reduces the effectiveness of the windbreaks. Weeds and insects prevent maximum growth. Clean cultivation and applications of herbicide help to control weeds (fig. 10). Fallowing a year before planting helps to provide a reserve supply of moisture, which is needed before seedlings can be established.

Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil

Figure 10.—An example of excellent weed control in a windbreak on Promise clay, 0 to 2 percent slopes.

Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Wildlife Habitat

Connie M. Vicuna, biologist, Soil Conservation Service, helped write this section.

The wildlife habitat in Potter County is primarily provided by cropland and range; however, it also is in areas of scattered shallow wetlands. Farm windbreaks provide cover. Small areas of woody cover also are in some drainageways along Lake Oahe. Whitetail deer, mule deer, cottontail, coyote, red fox, gray partridge, sharp-tailed grouse, and ring-necked pheasant are the major kinds of wildlife hunted for sport. In the spring and fall numerous species of duck and geese migrate through the county. Lake Oahe provides excellent fishing opportunities for walleye, northern pike, smelt, Chinook salmon, and silver bass. Lake Hurley and several other small reservoirs throughout the county provide additional fishing opportunities. Bass, bluegill, and northern pike inhabit most of the permanent water areas in the county.

The distribution and density of wildlife is related to the presence or absence of various habitat elements that provide sources of food and cover. These habitat elements include cropland, grasses and forbs, shrubs, trees, wetlands, and rivers and other water bodies. The general abundance of these habitat elements commonly corresponds to soil associations or groups of associations. Each association has a distinctive pattern of soils, relief, and drainage that results in characteristic vegetation and land use patterns. In the following paragraphs, the nine soil associations in Potter County, which are described under the heading "General Soil Map Units," are grouped into wildlife areas that differ in the kinds and abundance of wildlife, in their potential for producing habitat elements, and in other environmental factors.

Wildlife Area 1 consists of the Betts-Gettys and the Sansarc associations. It makes up about 7 percent of the county. It is on the steep slopes and in entrenched drainageways along Lake Oahe. Nearly all of this area is range. Rangeland wildlife species common to this area are mule deer, whitetail deer, and sharp-tailed grouse. Trees are scarce, except in scattered draws of the Betts-Gettys association and along Little Cheyenne and Artichoke Creeks. These wooded areas provide habitat for wild turkey. Pheasants frequent the grassland areas adjacent to the cropland of bordering associations. Bald eagles commonly winter along Lake Oahe. Other predators in this wildlife area include coyote, badger, and red fox.

This wildlife area is suited to rangeland wildlife habitat. The steep slopes and stoniness in the Betts-Gettys association are limitations affecting the development of wildlife habitat. Woody habitat can be developed in the scattered draws and narrow drainageways because of the favorable moisture conditions. The steep slopes, low available water capacity, and shallow depth to shale are limitations affecting the development of habitat in the Sansarc association.

Wildlife Area 2 consists of the Java-Betts-Glenham and Raber-Cavo associations. It makes up about 11 percent of the county. Most of this area is undulating to hilly. Many of the minor soils, such as Plankinton, Tetonka, and Worthing soils, provide wetland habitat for wildlife. Most of the soils in this area support native grasses, but some of the less sloping areas are used for forage crops or tame hay and pasture. Wildlife species of this area include meadowlarks, prairie chickens, sharp-tailed grouse, mule deer, and whitetail deer. Pheasant and mourning dove inhabit areas near cropland. Wetland wildlife species include bluewing teal, shovelers, pintails, mallards, and American widgeon. Muskrat inhabit some of the deeper wetland areas. Predators include red fox, coyote, and badger. Ferruginous hawks inhabit this area.

This wildlife area is suited to rangeland wildlife habitat. Some of the less sloping soils are suitable for the development of food plots and for a cover of tame grasses or legumes. Glenham and other soils are suited to the development of tree plots for wildlife food and cover. Plankinton, Tetonka, and Worthing soils are suited to wetland wildlife habitat and the development of shallow water areas. The sodium affected soils in the Raber-Cavo association have a more limited potential for the development of wildlife habitat.

Wildlife Area 3 consists of the Agar and Highmore associations. It makes up about 62 percent of the county. About 85 percent of the acreage is cropland. Small scattered tracts of rangeland are throughout the area. The largest tract of rangeland occurs as the minor Peno soils in the northwestern part of the Highmore association. Wetlands that consist of the minor Plankinton and Worthing soils are in the large lakebeds north of Gettysburg.

This wildlife area provides a major wintering site for many wildlife species in the county. Cropland wildlife species, such as ring-necked pheasant, gray partridge, and whitetail deer, are throughout the area but are less abundant in the Agar association. Large fields in the Agar association reduce the diversity and interspersion of cover. Nesting and winter cover for pheasants are limited in this area.

Because of the abundant fields of small grain and corn and the proximity to Lake Oahe, this wildlife area is excellent habitat for migrating geese. Golden eagles commonly winter in this area. Other resident predators include red fox, badger, coyote, and skunk.

This wildlife area is suitable for the development of food plots and for tame grasses and legumes, range, and woody cover. The minor soils, such as Plankinton and Worthing soils, are suited to wetland wildlife habitat and the development of shallow water areas.

Wildlife Area 4 is the Glenham-Java association. It makes up about 11 percent of the county. Scattered wetlands consisting of the minor Plankinton, Tetonka, and Worthing soils are throughout the area. About 75 percent of acreage is cropland. Much of the rangeland is on the steeper slopes.

Wildlife that inhabit this area include pheasant, mourning dove, gray partridge, and whitetail deer. Waterfowl species, such as teal, shovelers, pintails, mallards, and American widgeon, inhabit the wetlands. The interspersed wetlands provide most of the available winter cover for pheasant and deer. Predators include red fox, badger, skunk, and coyote.

This wildlife area is suitable for the development of food plots and woody cover. The minor soils, such as Plankinton, Tetonka, and Worthing soils, are suited to wetland wildlife habitat and the development of shallow water areas.

Wildlife Area 5 is the Promise-Opal association. It makes up about 5 percent of the county. About 65 percent of this area is cropland. Scattered areas of the minor sodium affected soils and the steeper soils along the drainageways are dominantly range. A small population of antelope inhabit this area. Other wildlife include whitetail deer, pheasant, mourning dove, gray partridge, coyote, red fox, skunk, and badger.

This wildlife area is suitable for the development of rangeland and cropland wildlife habitat. Trees and shrubs can be planted, but optimum growth is unlikely because the clayey subsoil restricts root penetration.

Wildlife Area 6 is the Oahe-Durrstein association. It makes up about 4 percent of the county. It is on outwash plains, terraces, and flood plains. About 60 percent of the area is cropland. The Durrstein soils on the flood plains are used for range and hay. Pheasant, mourning dove, gray partridge, and whitetail deer inhabit this area. A few sharp-tailed grouse inhabit the areas of range.

This wildlife area is suitable for the development of rangeland wildlife habitat. The Oahe soils are suited to the development of cropland wildlife habitat, but the Durrstein soils generally are unsuited. Trees and shrubs can be planted, but optimum growth is unlikely because the Oahe soils are droughty. The Durrstein soils generally are unsuited to woody plantings because of the sodium affected subsoil.

Individual soils have different potentials for the development and maintenance of wildlife habitat elements. The soil, therefore, affects the degree or extent to which wildlife habitat can be established or improved. In table 10 the soils in the survey area are rated according to their potential for providing each of the wildlife habitat elements. The ratings indicate the ease of establishing or maintaining these elements.

The potential of the soil for various habitat elements is rated good, fair, poor, or very poor in table 10. A rating of *good* indicates that the element is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element. The element can be established, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element are very severe and that unsatisfactory results can be expected. Establishing, improving, or maintaining the element is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, apple, hawthorn, and dogwood. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

Information concerning the elements needed to maintain and manage specific wildlife species can be obtained from the local office of the Soil Conservation Service or from the South Dakota Department of Game, Fish and Parks.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons (aerobic) are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 18.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 11). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

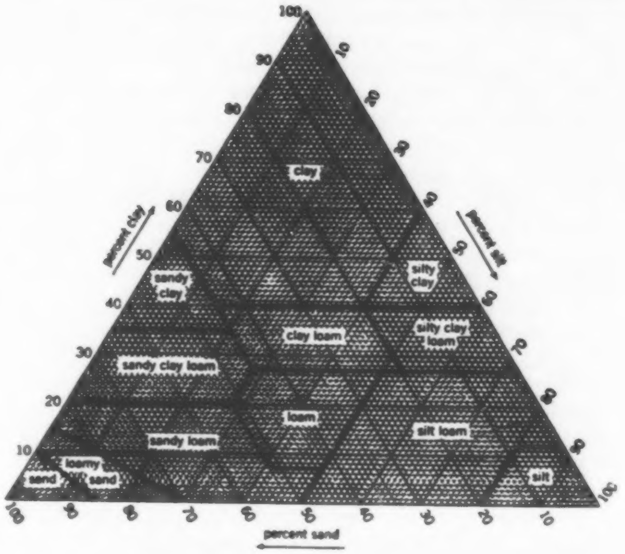

Figure 11.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 18.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K in this county range from 0.10 to 0.43. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.

7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to wind erosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

In table 17, some soils are assigned to two hydrologic groups. The first letter is for drained areas, and the second is for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs, on the average, once or less in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Engineering Index Test Data

Table 18 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series described in the section "Soil Series and Their Morphology." The soil samples were tested by the South Dakota Department of Transportation, Division of Highways.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); and Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*10*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Ustoll (*Ust*, meaning intermittent dryness, plus *oll*, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplustolls (*Hapl*, meaning minimal horizonation, plus *ustoll*, the suborder of the Mollisols that have an ustic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplustolls.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is coarse-silty, mixed, mesic Typic Haplustolls.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the underlying material can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual* (*7*). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (*10*). Unless otherwise stated, matrix colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Agar Series

The Agar series consists of deep, well drained soils that formed in loess on uplands. Permeability is moderate. Slopes range from 0 to 6 percent.

Agar soils are similar to Eakin, Highmore, and Lowry soils and are near Eakin, Highmore, Lowry, and Mobridge soils. Eakin soils are underlain by loamy glacial till at a depth of 20 to 40 inches. Highmore soils contain slightly more sand throughout than the Agar soils. Lowry soils do not have an argillic horizon. The moderately well drained Mobridge soils are in swales.

Typical pedon of Agar silt loam, 0 to 2 percent slopes, 1,950 feet north and 30 feet west of the southeast corner of sec. 26, T. 117 N., R. 78 W.

A—0 to 5 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak very fine granular structure; slightly hard, very friable; many roots; slightly acid; clear wavy boundary.

Bt1—5 to 11 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, very friable; many roots; neutral; clear wavy boundary.

Bt2—11 to 20 inches; grayish brown (10YR 5/2) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to weak medium subangular blocky; slightly hard, very friable; many roots; mildly alkaline; clear wavy boundary.

BCk—20 to 29 inches; light brownish gray (2.5Y 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; slightly hard, very friable; common roots; few fine accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

Ck—29 to 38 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; slightly hard, very friable; few roots; common fine accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

C—38 to 60 inches; light olive gray (5Y 6/2) silt loam, olive gray (5Y 5/2) moist; massive; slightly hard, very friable; few medium accumulations of carbonate; strong effervescence; strongly alkaline.

The thickness of the solum ranges from 15 to 35 inches. The depth to free carbonates ranges from 11 to 25 inches. The thickness of the mollic epipedon ranges from 7 to 20 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is 3 to 8 inches thick. It is slightly acid or neutral. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5 (3 or 4 moist), and chroma of 2 or 3. It is silt loam or silty clay loam that averages as low as 25 percent clay in some pedons and as high as 35 percent clay in others. Also, the content of fine sand or coarser sand is less than 3 percent. This horizon is neutral or mildly alkaline. The C horizon has value of 5 or 6 (4 or 5 moist) and chroma of 2 or 3. It is silt loam or silty clay loam. It ranges from mildly alkaline to strongly alkaline.

Betts Series

The Betts series consists of deep, well drained soils that formed in loamy glacial till on uplands. Permeability is moderate in the upper part of the soils and moderately slow in the underlying material. Slopes range from 6 to 60 percent.

Betts soils are similar to Gettys soils and are near Gettys, Java, and Schamber soils. Gettys soils contain more clay throughout than the Betts soils. Java soils have a mollic epipedon. They are lower on the landscape than the Betts soils. Schamber soils are underlain by gravelly sand at a depth of 4 to 10 inches. They are in positions on the landscape similar to those of the Betts soils.

Typical pedon of Betts loam, in an area of Betts-Java loams, 9 to 25 percent slopes, 1,320 feet east and 300 feet north of the southwest corner of sec. 23, T. 119 N., R. 74 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable; many roots; slight effervescence; neutral; clear wavy boundary.

AC—4 to 8 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak fine subangular blocky; slightly hard, very friable; common roots; strong effervescence; mildly alkaline; clear wavy boundary.

C1—8 to 23 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, very friable; common roots; strong effervescence; mildly alkaline; gradual wavy boundary.

C2—23 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; soft, very friable; few roots; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 4 to 10 inches. Free carbonates are typically at the surface; however, in some pedons they are leached to a depth of 3 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is 3 or 4 inches thick. It dominantly is loam, but in some pedons it is clay loam or stony loam. It ranges from neutral to moderately alkaline. The C horizon has value of 6 or 7 (4 to 6 moist) and chroma of 2 to 4. It is loam or clay loam. It is mildly alkaline or moderately alkaline.

Bon Series

The Bon series consists of deep, moderately well drained soils that formed in loamy alluvium on stream terraces and flood plains. Permeability is moderate. Slopes range from 0 to 2 percent.

Bon soils are near Agar, DeGrey, Highmore, Mobridge, and Walke soils. Agar and Highmore soils have a mollic epipedon that is less than 20 inches thick. They are on uplands. DeGrey and Walke soils have a natric horizon. They are slightly higher on the landscape than the Bon soils. Mobridge soils have an argillic horizon. They are in upland swales.

Typical pedon of Bon loam, channeled, 414 feet east and 30 feet south of the northwest corner of sec. 29, T. 117 N., R. 78 W.

A1—0 to 8 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; moderate fine granular structure; slightly hard, friable; many roots; neutral; clear wavy boundary.

A2—8 to 16 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; common roots; few fine dark concretions (iron and manganese oxide); mildly alkaline; gradual wavy boundary.

A3—16 to 23 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; common roots; few fine dark concretions (iron and manganese oxide); slight effervescence; moderately alkaline; gradual wavy boundary.

C1—23 to 33 inches; dark gray (10YR 4/1) and grayish brown (2.5Y 5/2) loam, very dark grayish brown (10YR 3/2) and dark grayish brown (2.5Y 4/2) moist; appears massive but has distinct bedding planes; hard, friable; few roots; few fine dark concretions (iron and manganese oxide); few fine accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

C2—33 to 51 inches; light brownish gray (2.5Y 6/2) and gray (10YR 5/1) clay loam, dark grayish brown (2.5Y 4/2) and very dark grayish brown (10YR 3/2) moist; appears massive but has distinct bedding planes; hard, firm; few fine dark concretions (iron and manganese oxide); few medium accumulations of carbonate; strong effervescence; moderately alkaline; abrupt wavy boundary.

C3—51 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; appears massive but has distinct bedding planes; hard, firm; few fine dark concretions (iron and manganese oxide); strong effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 48 inches. The depth to free carbonates ranges from 4 to 20 inches. The thickness of the mollic epipedon ranges from 20 to 40 inches.

The A horizon has value of 3 or 4 (2 or 3 moist) and chroma of 1 or 2. It ranges from neutral to moderately alkaline. It is 20 to 30 inches thick. The C horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6 (3 or 4 moist), and chroma of 1 or 2. It is clay loam or loam. It is mildly alkaline or moderately alkaline.

Cavo Series

The Cavo series consists of deep, moderately well drained soils that formed in loamy and clayey glacial till on uplands. Permeability is very slow in the subsoil and moderately slow in the underlying material. Slopes range from 0 to 6 percent.

Cavo soils are similar to DeGrey and Walke soils and are near Glenham, Jerauld, and Raber soils. DeGrey and Walke soils contain less sand in the subsoil than the Cavo soils. Also, Walke soils do not have columnar structure in the subsoil. Glenham and Raber soils do not have a natric horizon. They are on slight rises. Jerauld soils have visible salts within a depth of 16 inches. They are slightly lower on the landscape than the Cavo soils.

Typical pedon of Cavo loam, 0 to 2 percent slopes, 2,380 feet north and 110 feet east of the southwest corner of sec. 10, T. 118 N., R. 74 W.

A—0 to 4 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; weak fine granular structure; slightly hard, friable; many roots; neutral; clear smooth boundary.

E—4 to 8 inches; light brownish gray (10YR 6/2) loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure parting to weak fine granular; slightly hard, friable; many roots; neutral; abrupt smooth boundary.

Bt—8 to 14 inches; dark grayish brown (2.5Y 4/2) clay, very dark grayish brown (2.5Y 3/2) moist; thin continuous gray (10YR 5/1) coatings on tops of columns; moderate medium columnar structure parting to strong medium and coarse blocky; very hard, firm; common roots; mildly alkaline; clear wavy boundary.

BCk—14 to 22 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate medium and coarse subangular blocky; very hard, firm; common roots; common fine accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

Ckz—22 to 37 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm; few roots to a depth of 30 inches; few fine accumulations of carbonate and salts; violent effervescence; moderately alkaline; abrupt wavy boundary.

C—37 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 32 inches. The depth to free carbonates ranges from 12 to 20 inches. The thickness of the mollic epipedon ranges from 13 to 19 inches. The sodium adsorption ratio of the natric horizon ranges from about 10 to 15.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It dominantly is loam, but in some pedons it is silt loam. It is slightly acid or neutral. It is 3 to 6 inches thick. The E horizon has value of 5 or 6 (3 or 4 moist) and chroma of 1 or 2. It is loam or silt loam 2 to 4 inches thick. It is slightly acid or neutral. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5 (3 or 4 moist), and chroma of 1 or 2. It is clay loam or clay. It is mildly alkaline or moderately alkaline. The C horizon has value of 5 or 6 (4 or 5 moist) and chroma of 2 to 4. It is clay loam or clay. It is moderately alkaline or strongly alkaline.

Davison Series

The Davison series consists of deep, moderately well drained soils that formed in glacial melt water sediments in swales on uplands. Permeability is moderate. Slopes range from 0 to 2 percent.

Davison soils are near Durrstein, Oahe, and Regan soils. Durrstein soils have a natric horizon. They are slightly lower on the landscape than the Davison soils. Oahe soils are 20 to 40 inches deep to gravelly material. They are in positions on the landscape similar to those of the Davison soils. The very poorly drained Regan soils are in positions on the landscape similar to those of the Davison soils.

Typical pedon of Davison loam, 2,460 feet west and 530 feet north of the southeast corner of sec. 6, T. 119 N., R. 73 W.

Ap—0 to 6 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak thin platy and weak fine granular structure; slightly hard, friable; many roots; strong effervescence; mildly alkaline; abrupt smooth boundary.

A—6 to 12 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; hard, friable; many roots; common fine accumulations of carbonate; violent effervescence; mildly alkaline; clear wavy boundary.

Bk—12 to 30 inches; light gray (2.5Y 7/2) loam, grayish brown (2.5Y 5/2) moist; weak medium subangular blocky structure; hard, firm; few roots; many disseminated carbonates; violent effervescence; mildly alkaline; clear wavy boundary.

Ckg—30 to 60 inches; light gray (2.5Y 7/2) loam, light brownish gray (2.5Y 6/2) moist; few fine distinct yellowish brown (10YR 5/6) mottles; massive; hard, firm; few fine accumulations of gypsum; common fine accumulations of carbonate; violent effervescence; moderately alkaline.

The thickness of the mollic epipedon ranges from 7 to 15 inches. Most pedons have free carbonates at the surface, but some pedons are leached to a depth of 6 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. It dominantly is loam, but in some pedons it is silt loam. It ranges from neutral to moderately alkaline. It is 7 to 15 inches thick. The B horizon has hue of 2.5Y or 5Y, value of 6 or 7 (4 or 5 moist), and chroma of 2 to 4. It is clay loam or loam. It is mildly alkaline or moderately alkaline. The C horizon has hue of 2.5Y or 5Y, value of 6 or 7 (4 to 6 moist), and chroma of 1 to 4. It is clay loam or loam. It is mildly alkaline or moderately alkaline.

DeGrey Series

The DeGrey series consists of deep, moderately well drained soils that formed in silty and clayey material over loamy glacial till. These soils are on uplands. Permeability is very slow in the solum and moderately slow in the underlying material. Slopes range from 0 to 2 percent.

DeGrey soils are similar to Cavo and Walke soils and are near Agar, Highmore, Mobridge, and Walke soils. Agar and Highmore soils do not have a natric horizon. They are on convex uplands. Cavo soils contain more sand in the subsoil than the DeGrey soils. Mobridge soils do not have a natric horizon and have a mollic epipedon that is more than 20 inches thick. They are in swales. Walke soils do not have columnar structure in the subsoil.

Typical pedon of DeGrey silt loam, 1,860 feet east and 2,580 feet south of the northwest corner of sec. 30, T. 119 N., R. 74 W.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, very dark gray (10YR 3/1) moist; weak fine granular structure; soft, very friable; many roots; slightly acid; abrupt smooth boundary.

A2—4 to 7 inches; dark grayish brown (10YR 4/2) silt loam, very dark gray (10YR 3/1) moist; weak fine and medium subangular blocky structure parting to weak fine granular; slightly hard, very friable; many roots; slightly acid; abrupt smooth boundary.

E—7 to 9 inches; light brownish gray (10YR 6/2) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure parting to weak fine granular; slightly hard, very friable; many roots; neutral; abrupt smooth boundary.

Bt1—9 to 14 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate medium columnar structure parting to moderate fine and medium subangular blocky; very hard, very firm; many roots; mildly alkaline; clear wavy boundary.

Bt2—14 to 20 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to strong medium and coarse subangular blocky; very hard, very firm; many roots; moderately alkaline; clear wavy boundary.

BCkz—20 to 30 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, firm; common roots; few fine accumulations of carbonate; common fine and medium nests of gypsum and other salts; strong effervescence; moderately alkaline; gradual wavy boundary.

Cz—30 to 39 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm; few roots; few fine and medium nests of gypsum and other salts; strong effervescence; strongly alkaline; gradual wavy boundary.

2C—39 to 60 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable; few roots to a depth of 50 inches; few fine and medium nests of gypsum and other salts; strong effervescence; strongly alkaline.

The thickness of the solum ranges from 18 to 32 inches. The depth to free carbonates ranges from 10 to 24 inches. The thickness of the mollic epipedon ranges from 7 to 20 inches. The depth to loamy glacial till ranges from 30 to more than 60 inches. The sodium adsorption ratio in the natric horizon ranges from about 10 to 15.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is 3 to 7 inches thick. It is slightly acid or neutral. The E horizon has value of 5 to 7 (3 or 4 moist) and chroma of 1 or 2. It is 1 to 4 inches thick. It is slightly acid or netural. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5 (3 or 4 moist), and chroma of 1 or 2. It is silty clay or silty clay loam. It ranges from neutral to moderately alkaline. The C horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4. It is moderately alkaline or strongly alkaline. The 2C horizon is loam or clay loam. In some pedons it is below a depth of 60 inches.

Delmont Series

The Delmont series consists of somewhat excessively drained soils that are shallow over gravelly sand. These soils formed in loamy alluvium over gravelly sand. They are on outwash plains and terraces. Permeability is moderate in the solum and rapid in the underlying material. Slopes range from 0 to 15 percent.

Delmont soils are similar to Oahe soils and are near Oahe, Ree, and Schamber soils. Oahe soils are 20 to 40 inches deep to gravelly material. Ree soils are more than 40 inches deep to gravelly material. They are lower on the landscape than the Delmont soils. Schamber soils are less than 10 inches deep to gravelly material. They are on knolls and ridges.

Typical pedon of Delmont loam, in an area of Oahe-Delmont loams, 2 to 6 percent slopes, 525 feet east and 750 feet north of the southwest corner of sec. 35, T. 119 N., R. 74 W.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable; many roots; neutral; abrupt smooth boundary.

Bw1—4 to 9 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to weak medium and fine subangular blocky; slightly hard, very friable; common roots; neutral; clear wavy boundary.

Bw2—9 to 16 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable; common roots; mildly alkaline; abrupt irregular boundary.

2C—16 to 60 inches; multicolored gravelly loamy sand; single grain; loose; carbonate coatings on the underside of pebbles in the upper few inches; few roots to a depth of 24 inches; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 14 to 20 inches and correspond to the depth to the gravelly underlying material. The solum is neutral or mildly alkaline throughout. The thickness of the mollic epipedon ranges from 10 to 20 inches.

The A horizon has value of 3 or 4 (2 or 3 moist) and chroma of 1 or 2. It is 4 to 7 inches thick. The Bw horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. Some pedons have a BC horizon. The 2C horizon is mildly alkaline or moderately alkaline.

Durrstein Series

The Durrstein series consists of deep, poorly drained soils that formed in clayey and loamy alluvium on flood plains. Permeability is very slow. Slopes are less than 1 percent.

Durrstein soils are similar to Hoven soils and are near Davison, Hoven, Ranslo, and Regan soils. Davison and Regan soils do not have a natric horizon. Davison soils are slightly higher on the landscape than the Durrstein soils. Regan soils are in positions on the landscape similar to those of the Durrstein soils. The solum of Hoven soils is thicker than that of the Durrstein soils. The somewhat poorly drained Ranslo soils have a surface layer that is thicker than that of the Durrstein soils. Also, they are slightly higher on the landscape.

Typical pedon of Durrstein silt loam, 2,170 feet north and 2,360 feet west of the southeast corner of sec. 28, T. 119 N., R. 74 W.

E—0 to 2 inches; grayish brown (10YR 5/2) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure parting to weak fine granular; soft, very friable; many roots; slightly acid; abrupt smooth boundary.

Bt1--2 to 6 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; grayish brown (10YR 5/2) coatings on tops of columns; moderate medium columnar structure parting to strong fine and medium subangular blocky; extremely hard, firm; many roots; moderately alkaline; clear smooth boundary.

Bt2—6 to 11 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, firm; few roots; few fine and medium threads and nests of salts; strong effervescence; moderately alkaline; clear wavy boundary.

BCzg—11 to 15 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, firm; few roots; common fine and medium threads and nests of salts; strong effervescence; strongly alkaline; clear wavy boundary.

Ckzg1—15 to 32 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm; few roots; few accumulations of carbonate; few fine and medium threads and nests of salts; strong effervescence; strongly alkaline; gradual wavy boundary.

Ckzg2—32 to 43 inches; light brownish gray (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; few fine distinct yellowish brown (10YR 5/6) mottles; massive; hard, firm; common fine accumulations of carbonate; few fine accumulations of salts; slight effervescence; strongly alkaline; gradual wavy boundary.

Cg—43 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; few fine distinct yellowish brown (10YR 5/6) mottles; massive; slightly hard, firm; few pebbles and fragments of shale; slight effervescence; strongly alkaline.

The thickness of the solum ranges from 10 to 30 inches. The depth to salt crystals ranges from 5 to 15 inches. The sodium adsorption ratio of the natric horizon ranges from about 13 to 25.

Some pedons have an A horizon, which is less than 2 inches thick. The E horizon has value of 5 or 6 (3 or 4 moist) and chroma of 1 or 2. It dominantly is silt loam, but in some pedons it is silty clay loam. It is slightly acid or neutral. It is 1 to 4 inches thick. The Bt horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is clay, clay loam, or silty clay. It is neutral to moderately alkaline in the upper part and mildly alkaline to strongly alkaline in the lower part. The C horizon has hue of 2.5Y or 5Y, value of 5 to 7 (3 to 5 moist), and chroma of 1 or 2. It is silty clay, clay loam, or silty clay loam. It is moderately alkaline or strongly alkaline. Some pedons have a 2C horizon of stratified loamy fine sand, fine sand, fine sandy loam, loamy very fine sand, and very fine sandy loam.

Eakin Series

The Eakin series consists of deep, well drained soils that formed in silty material over loamy glacial till. These soils are on uplands. Permeability is moderate in the solum and moderately slow in the underlying material. Slopes range from 0 to 9 percent.

Eakin soils are similar to Agar, Highmore, and Lowry soils and are near Agar, Highmore, Mobridge, and Peno soils. Agar, Highmore, Lowry, and Mobridge soils do not have loamy glacial till within a depth of 40 inches. Also, Mobridge soils have a mollic epipedon that is more than 20 inches thick. They are in swales. Peno soils formed in loamy glacial till and contain more clay and less silt in the subsoil than the Eakin soils. They are in positions on the landscape similar to those of the Eakin soils.

Typical pedon of Eakin silt loam, in an area of Eakin-Peno complex, 2 to 6 percent slopes, 765 feet south and 1,400 feet east of the northwest corner of sec. 27, T. 117 N., R. 77 W.

Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; weak very fine granular structure; slightly hard, very friable; many roots; slightly acid; abrupt smooth boundary.

Bt1—7 to 11 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; many roots; neutral; clear wavy boundary.

Bt2—11 to 16 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; common roots; neutral; clear wavy boundary.

BCk—16 to 30 inches; light yellowish brown (2.5Y 6/4) silt loam, light olive brown (2.5Y 5/4) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable; common roots; few medium accumulations of carbonate; strong effervescence; mildly alkaline; clear wavy boundary.

2Ck—30 to 40 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, firm; few brown (7.5YR 4/4) iron stains; few fragments of shale; common medium accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

2C—40 to 60 inches; grayish brown (2.5Y 5/2) and light yellowish brown (2.5Y 6/4) clay loam, dark grayish brown (2.5Y 4/2) and light olive brown (2.5Y 5/4) moist; massive; hard, firm; few brown (7.5YR 4/4) iron stains; few fragments of shale; few fine accumulations of carbonate; slight effervescence; moderately alkaline.

The thickness of the solum ranges from 19 to 30 inches. The depth to firm, loamy glacial till ranges from 20 to 40 inches. The depth to free carbonates ranges from 10 to 18 inches. The thickness of the mollic epipedon ranges from 7 to 18 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is 4 to 6 inches thick. It is slightly acid or neutral. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5 (3 or 4 moist), and chroma of 2 or 3. It is neutral or mildly alkaline. The 2C horizon has hue of 2.5Y or 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4. It is clay loam or loam. It ranges from mildly alkaline to strongly alkaline.

Gettys Series

The Gettys series consists of deep, well drained soils that formed in loamy glacial till on uplands. Permeability is moderately slow. Slopes range from 9 to 40 percent.

Gettys soils are similar to Betts soils and commonly are near Betts, Peno, Raber, Sansarc, and Schamber soils. Betts soils contain less clay between depths of 10 and 40 inches than the Gettys soils. Peno and Raber soils have an argillic horizon. They are on the less sloping parts of the landscape. The shallow Sansarc soils formed in clayey material weathered from Pierre Shale. Schamber soils formed in sandy and gravelly sediments. Sansarc and Schamber soils are in positions on the landscape similar to those of the Gettys soils.

Typical pedon of Gettys clay loam, in an area of Raber-Gettys complex, 9 to 25 percent slopes, 1,999 feet east and 750 feet north of the southwest corner of sec. 16, T. 120 N., R. 76 W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) clay loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure parting to weak fine granular; hard, friable; many roots; neutral; clear smooth boundary.

AC—3 to 8 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure parting to weak medium and fine subangular blocky; hard, friable; many roots; few fine and medium accumulations of carbonate; strong effervescence; mildly alkaline; clear wavy boundary.

Ck—8 to 30 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium and coarse subangular blocky structure; very hard, friable; common roots; few brown (7.5YR 4/4) iron stains; common fine and medium accumulations of carbonate; violent effervescence; mildly alkaline; gradual wavy boundary.

C—30 to 60 inches; olive (5Y 5/3) clay loam, olive gray (5Y 4/2) moist; massive; hard, friable; few brown (7.5YR 4/4) iron stains; few fine accumulations of carbonate; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 7 to 14 inches. Free carbonates are at or near the surface.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5 (2 to 4 moist), and chroma of 1 or 2. It is clay loam or stony clay loam. It is neutral or mildly alkaline. It is 2 to 4 inches thick. The C horizon has hue of 2.5Y or 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 1 to 3. It is clay loam or clay. It is mildly alkaline or moderately alkaline.

Glenham Series

The Glenham series consists of deep, well drained soils that formed in loamy glacial till on uplands. Permeability is moderate in the solum and moderately slow in the underlying material. Slopes range from 0 to 6 percent.

Glenham soils are similar to Java and Raber soils and commonly are near Betts, Java, Plankinton, and Prosper soils. Betts and Java soils do not have an argillic horizon. They are steeper than the Glenham soils. The poorly drained Plankinton soils are in depressions. The moderately well drained Prosper soils are in swales. Raber soils contain more clay in the subsoil than the Glenham soils.

Typical pedon of Glenham loam, 0 to 2 percent slopes, 1,358 feet east and 1,923 feet north of the southwest corner of sec. 24, T. 120 N., R. 73 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, very friable; many roots; neutral; clear smooth boundary.

Bt1—4 to 9 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; many roots; neutral; clear wavy boundary.

Bt2—9 to 14 inches; grayish brown (2.5Y 5/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium and coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, friable; many roots; neutral; clear wavy boundary.

BCk1—14 to 19 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; slightly hard, friable; common roots; many fine accumulations of carbonate; strong effervescence; mildly alkaline; clear wavy boundary.

BCk2—19 to 28 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; slightly hard, friable; few roots; many fine and medium accumulations of carbonate; violent effervescence; mildly alkaline; clear wavy boundary.

C—28 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable; few brown (7.5YR 4/4) iron stains; few fragments of shale; few fine accumulations of carbonate; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 14 to 30 inches. The depth to free carbonates ranges from 10 to 19 inches. The thickness of the mollic epipedon ranges from 7 to 16 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. It is 3 to 6 inches thick. It ranges from slightly acid to mildly alkaline. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5 (3 or 4 moist), and chroma of 2 or 3. It is loam or clay loam that averages as low as 25 percent clay in some pedons and as high as 35 percent clay in others. It is neutral or mildly alkaline. The C horizon has hue of 10YR or 2.5Y, value of 6 or 7 (5 or 6 moist), and chroma of 2 to 4. It is loam or clay loam. In some pedons it has relic mottles and gypsum crystals. It is mildly alkaline or moderately alkaline.

Highmore Series

The Highmore series consists of deep, well drained soils that formed in silty material on uplands. Permeability is moderate. Slopes range from 0 to 9 percent.

Highmore soils are similar to Agar, Eakin, and Lowry soils and are near Eakin, Mobridge, and Peno soils. Agar and Lowry soils formed in loess. Eakin soils are 20 to 40 inches deep to loamy glacial till. The moderately well drained Mobridge soils are in swales. Peno soils are slightly higher on the landscape than the Highmore soils and contain more clay and sand in the subsoil.

Typical pedon of Highmore silt loam, 0 to 2 percent slopes, 2,380 feet west and 260 feet north of the southeast corner of sec. 7, T. 117 N., R. 75 W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam, very dark gray (10YR 3/1) moist; weak fine granular structure; slightly hard, friable; many roots; slightly acid; abrupt smooth boundary.

Bt1—5 to 10 inches; dark grayish brown (2.5Y 4/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium prismatic structure parting to weak medium and coarse subangular blocky; hard, friable; many roots; neutral; clear wavy boundary.

Bt2—10 to 16 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to weak medium and coarse subangular blocky; hard, friable; many roots; neutral; gradual wavy boundary.

BCk—16 to 22 inches; light olive brown (2.5Y 5/4) silty clay loam, olive brown (2.5Y 4/4) moist; moderate medium prismatic structure parting to weak medium and coarse subangular blocky; hard, friable; common roots; few fine and medium accumulations of carbonate; strong effervescence; mildly alkaline; gradual wavy boundary.

Ck—22 to 32 inches; light yellowish brown (2.5Y 6/4) silt loam, light olive brown (2.5Y 5/4) moist; massive; hard, friable; common roots; common fine and medium accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

C1—32 to 48 inches; light yellowish brown (2.5Y 6/4) silt loam, light olive brown (2.5Y 5/4) moist; few fine distinct gray (N 5/0) mottles; massive; hard, friable; few roots; very few fine and medium accumulations of carbonate; strong effervescence; moderately alkaline; abrupt wavy boundary.

C2—48 to 60 inches; light yellowish brown (2.5Y 6/4) silt loam, light olive brown (2.5Y 5/4) moist; many fine and medium distinct gray (N 5/0) mottles; massive; hard, friable; few brown (7.5YR 4/4) iron stains; slight effervescence; moderately alkaline.

The thickness of the solum ranges from 15 to 35 inches. The depth to free carbonates ranges from 12 to 25 inches. The thickness of the mollic epipedon ranges from 9 to 20 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. It ranges from 5 to 8 inches in thickness. It is slightly acid or neutral. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5 (3 or 4 moist), and chroma of 2 or 3. The clay content in this horizon is as low as 27 percent in some pedons and as high as 35 percent in others. Also, the content of sand that is coarser than very fine sand is 3 to 15 percent. The Bt horizon is neutral or mildly alkaline. The C horizon has value of 5 or 6 (4 or 5 moist) and chroma of 2 to 4. It is silt loam or silty clay loam. It is mildly alkaline or moderately alkaline. In some pedons loam or clay loam glacial till is at a depth of 40 to 60 inches.

Hoven Series

The Hoven series consists of deep, poorly drained soils that formed in clayey alluvium in depressions on uplands. Permeability is very slow. Slopes are 0 to 1 percent.

Hoven soils are similar to Durrstein and Plankinton soils and are near Durrstein, Mobridge, Plankinton, Prosper, and Tetonka soils. Durrstein soils have visible salt crystals within a depth of 16 inches. Mobridge, Plankinton, Prosper, and Tetonka soils do not have a natric horizon. Mobridge and Prosper soils are in swales. Plankinton and Tetonka soils are in positions on the landscape similar to those of the Hoven soils.

Typical pedon of Hoven silt loam, 520 feet south and 2,320 feet east of the northwest corner of sec. 9, T. 117 N., R. 78 W.

E—0 to 4 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure; slightly hard, friable; many roots; slightly acid; abrupt smooth boundary.

Bt—4 to 10 inches; dark gray (10YR 4/1) clay, black (10YR 2/1) moist; continuous gray (10YR 5/1) coatings on tops of columns and thin coatings on vertical faces of peds; strong medium columnar structure parting to strong fine and medium subangular blocky; very hard, firm; many roots; neutral; gradual wavy boundary.

Btg—10 to 17 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; strong medium and coarse prismatic structure parting to strong coarse and medium subangular blocky; very hard, firm; common roots; mildly alkaline; gradual wavy boundary.

BCg—17 to 30 inches; dark gray (10YR 4/1) silty clay, very dark gray (10YR 3/1) moist; strong coarse prismatic structure parting to strong coarse subangular blocky; very hard, firm; few roots; mildly alkaline; gradual wavy boundary.

Ckg1—30 to 37 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; hard, friable; few roots; few fine and medium accumulations of carbonate; slight effervescence; moderately alkaline; gradual wavy boundary.

Ckg2—37 to 44 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable; many fine accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

Cg—44 to 60 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; massive; slightly hard, friable; common fine accumulations of carbonate; slight effervescence; moderately alkaline.

The thickness of the solum ranges from 15 to 35 inches. Some pedons have an A horizon, which is 1 to 4 inches thick. The sodium adsorption ratio of the natric horizon ranges from about 5 to 15.

The E horizon has value of 5 to 7 (2 or 3 moist) and chroma of 1 or 2. It is 2 to 6 inches thick. It ranges from medium acid to neutral. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5 (2 or 3 moist), and chroma of 1 or 2. It is clay or silty clay. It ranges from slightly acid to mildly alkaline in the upper part and is mildly alkaline or moderately alkaline in the lower part. The C horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6 (3 to 5 moist), and chroma of 1 or 2. It is silty clay, clay, silty clay loam, or clay loam. It is mildly alkaline or moderately alkaline.

Hurley Series

The Hurley series consists of moderately deep, moderately well drained soils that formed in material weathered from clayey shale on uplands. Permeability is very slow. Slopes range from 0 to 6 percent.

Hurley soils are similar to Jerauld soils and are near Opal and Promise soils. Jerauld soils formed in clayey glacial till and contain less clay throughout than the Hurley soils. Opal and Promise soils do not have a natric horizon. They are slightly higher on the landscape than the Hurley soils.

Typical pedon of Hurley silt loam, 2,215 feet south and 425 feet east of the northwest corner of sec. 17, T. 119 N., R. 76 W.

E—0 to 3 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure parting to weak fine granular; slightly hard, friable; many roots; slightly acid; abrupt smooth boundary.

Bt—3 to 9 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; gray (10YR 5/1) coatings on tops of columns; moderate medium columnar structure parting to strong medium and coarse subangular blocky; hard, firm; many roots; mildly alkaline; clear wavy boundary.

BCkz—9 to 16 inches; dark grayish brown (2.5Y 4/2) clay, very dark grayish brown (2.5Y 3/2) moist; moderate medium and coarse subangular blocky structure; hard, firm; common roots; few fine accumulations of carbonate; few fine and medium nests of salts; slight effervescence; moderately alkaline; gradual wavy boundary.

Ckyz—16 to 25 inches; grayish brown (2.5Y 5/2) shaly clay, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm; few roots; few fine accumulations of carbonate; many fine and medium nests of gypsum and other salts; slight effervescence; mildly alkaline; gradual wavy boundary.

Cr—25 to 60 inches; light brownish gray (2.5Y 6/2) shale, dark grayish brown (2.5Y 4/2) moist; mildly alkaline.

The thickness of the solum ranges from 9 to 20 inches. The depth to free carbonates ranges from 4 to 12 inches. The depth to shale ranges from 20 to 40 inches. The sodium adsorption ratio in the natric horizon ranges from about 10 to 20.

The E horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6 (3 or 4 moist), and chroma of 1 or 2. It dominantly is silt loam, but in some pedons it is silty clay loam. It is 1 to 4 inches thick. It is slightly acid or neutral. The Bt horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 or 5 (2 or 3 moist), chroma of 1 or 2. It is mildly alkaline or moderately alkaline. The clay content in this horizon is as low as 60 percent in some pedons and as high as 70 percent in others. The C horizon has hue of 2.5Y or 5Y, value of 5 or 6 (4 or 5 moist), chroma of 1 or 2. It ranges from mildly alkaline to strongly alkaline. The Cr horizon ranges from slightly acid to moderately alkaline.

Java Series

The Java series consists of deep, well drained soils that formed in loamy glacial till on uplands. Permeability is moderate in the subsoil and moderately slow in the underlying glacial till. Slopes range from 2 to 25 percent.

Java soils are similar to Glenham soils and commonly are near Betts, Glenham, and Prosper soils. Betts soils do not have a mollic epipedon. They generally are steeper than the Java soils. Glenham and Prosper soils have an argillic horizon. Prosper soils are in swales.

Typical pedon of Java loam, in an area of Java-Glenham loams, 2 to 6 percent slopes, 400 feet west and 325 feet south of the northeast corner of sec. 3, T. 120 N., R. 74 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable; many roots; mildly alkaline; abrupt smooth boundary.

Bw—4 to 9 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, very friable; many roots; mildly alkaline; clear wavy boundary.

BCk—9 to 16 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard, very friable; common roots; few fine and medium accumulations of carbonate; strong effervescence; mildly alkaline; gradual wavy boundary.

Ck—16 to 34 inches; pale yellow (2.5Y 7/4) clay loam, light yellowish brown (2.5Y 6/4) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard, very friable; few roots to a depth of 30 inches; many fine and medium accumulations of carbonate; violent effervescence; moderately alkaline; gradual wavy boundary.

C—34 to 60 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, very friable; slight effervescence; moderately alkaline.

The thickness of the solum ranges from 10 to 20 inches. The depth to free carbonates is less than 10 inches. The thickness of the mollic epipedon ranges from 7 to 10 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is 3 or 4 inches thick. It is neutral or mildly alkaline. The Bw horizon has hue of 10YR or 2.5Y, value of 4 or 5 (2 or 3 moist), and chroma of 2 or 3. It is clay loam or loam. It is neutral or mildly alkaline. The C horizon has hue of 2.5Y or 5Y, value of 6 or 7 (5 or 6 moist), and chroma of 2 to 4. It is clay loam or loam. It is mildly alkaline or moderately alkaline. It has relic mottles, shale chips, and gypsum crystals in some pedons.

Jerauld Series

The Jerauld series consists of deep, moderately well drained soils that formed in clayey glacial till on uplands. Permeability is very slow. Slopes range from 0 to 3 percent.

Jerauld soils are similar to Hurley soils and are near Cavo and Raber soils. Cavo soils have a solum that is thicker than that of the Jerauld soils and do not have visible salts within a depth of 16 inches. Hurley soils are 20 to 40 inches deep to shale and contain more clay throughout than the Jerauld soils. Raber soils do not have a natric horizon. The nearby soils are slightly higher on the landscape than the Jerauld soils.

Typical pedon of Jerauld silt loam, 1,390 feet south and 750 feet east of the northwest corner of sec. 18, T. 120 N., R. 75 W.

E—0 to 3 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure; soft, very friable; many roots; slightly acid; abrupt smooth boundary.

Bt—3 to 8 inches; dark grayish brown (2.5Y 4/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; thin continuous gray (10YR 5/1) coatings on tops of columns; strong medium and coarse columnar structure parting to moderate medium and coarse subangular blocky; very hard, firm; many roots; neutral; clear wavy boundary.

Btk—8 to 13 inches; dark grayish brown (2.5Y 4/2) clay, very dark grayish brown (2.5Y 3/2) moist; moderate coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, firm; many roots; few fine accumulations of carbonate; slight effervescence; moderately alkaline; clear wavy boundary.

BCkz—13 to 18 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse subangular blocky structure; hard, firm; common roots; few fine and medium accumulations of carbonate; few fine nests of salts; strong effervescence; moderately alkaline; clear wavy boundary.

Ckz—18 to 26 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm; few roots; few fine accumulations of carbonate; common fine nests of salts; violent effervescence; moderately alkaline; gradual wavy boundary.

C—26 to 60 inches; olive gray (5Y 5/2) clay, olive gray (5Y 4/2) moist; common fine and medium distinct dark red (2.5YR 3/6) mottles; massive; hard, firm; few fragments of shale; slight effervescence; moderately alkaline.

The thickness of the solum ranges from 10 to 20 inches. The depth to free carbonates and the thickness of the mollic epipedon range from 7 to 15 inches. The sodium adsorption ratio in the subsoil ranges from about 15 to 25.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7 (3 to 5 moist), and chroma of 1 or 2. It dominantly is silt loam, but in some pedons it is loam or silty clay loam. It ranges from medium acid to neutral. It is 1 to 5 inches thick. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5 (2 or 3 moist), and chroma of 1 or 2. It is clay loam, clay, or silty clay. It ranges from neutral to moderately alkaline. The C horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 1 to 4. It is silty clay loam, clay loam, silty clay, or clay. It ranges from mildly alkaline to strongly alkaline.

Lowry Series

The Lowry series consists of deep, well drained soils that formed in loess on uplands. Permeability is moderate. Slopes range from 0 to 15 percent.

Lowry soils are similar to Agar, Eakin, and Highmore soils and are near Agar, Mobridge, and Peno soils. Agar, Eakin, Highmore, Mobridge, and Peno soils have an argillic horizon. Mobridge soils are moderately well drained and are in swales. Peno soils formed in loamy glacial till. They are on the more convex parts of the landscape.

Typical pedon of Lowry silt loam, 2 to 6 percent slopes, 2,218 feet east and 1,726 feet south of the northwest corner of sec. 14, T. 120 N., R. 78 W.

A1—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable; many roots; neutral; clear smooth boundary.

A2—3 to 5 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, very friable; many roots; neutral; abrupt wavy boundary.

Bw—5 to 11 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, very friable; many roots; mildly alkaline; clear wavy boundary.

BCk—11 to 19 inches; grayish brown (10YR 5/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, very friable; common roots; many fine and medium accumulations of carbonate; slight effervescence; mildly alkaline; gradual wavy boundary.

Ck—19 to 33 inches; light brownish gray (10YR 6/2) silt loam, grayish brown (10YR 5/2) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; slightly hard, very friable; common roots; common fine accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

C—33 to 60 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, very friable; few roots to a depth of 40 inches; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 14 to 30 inches. The depth to free carbonates ranges from 8 to 20 inches. The thickness of the mollic epipedon ranges from 7 to 20 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 2 or 3. It is 4 to 7 inches thick. It is neutral or mildly alkaline. The B horizon has hue of 10YR or 2.5Y, value of 4 or 5 (3 or 4 moist), and chroma of 2 or 3. It ranges from neutral to moderately alkaline. The C horizon has hue of 10YR or 2.5Y, value of 5 or 6 (4 or 5 moist), and chroma of 2 or 3. It is silt loam or very fine sandy loam. It is mildly alkaline or moderately alkaline.

Mobridge Series

The Mobridge series consists of deep, moderately well drained soils that formed in silty alluvium in swales on uplands. Permeability is moderate. Slopes range from 0 to 3 percent.

Mobridge soils are similar to Prosper soils and are near Agar, Eakin, Highmore, and Lowry soils. The nearby soils have a mollic epipedon that is less than 20 inches thick. They are higher on the landscape than the Mobridge soils. Prosper soils contain more sand and less silt in the subsoil than the Mobridge soils.

Typical pedon of Mobridge silt loam, in an area of Agar-Mobridge silt loams, 0 to 3 percent slopes, 863 feet south and 1,263 feet east of the northwest corner of sec. 12, T. 119 W., R. 78 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; hard, very friable; common roots; neutral; abrupt smooth boundary.

A—7 to 10 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure parting to weak fine and medium granular; hard, very friable; common roots; neutral; clear smooth boundary.

Bt—10 to 28 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard, friable; common roots; neutral; clear wavy boundary.

BCk—28 to 35 inches; grayish brown (10YR 5/2) silty clay loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; hard, friable; few roots; few fine accumulations of carbonate; slight effervescence; moderately alkaline; clear smooth boundary.

Ck—35 to 43 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; weak coarse subangular blocky structure parting to weak medium subangular blocky; hard, friable; few roots; common fine and medium accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

C—43 to 60 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; massive; hard, friable; few roots; few fine accumulations of carbonate; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 21 to 46 inches. The depth to free carbonates ranges from 17 to 50 inches. The mollic epipedon ranges from 20 to 34 inches in thickness and includes part or all of the Bt horizon.

The A horizon has value of 3 or 4 (2 or 3 moist) and chroma of 1 or 2. It ranges from 7 to 14 inches in thickness. It is slightly acid or neutral. The Bt horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. It ranges from slightly acid to mildly alkaline. The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 or 3. It is silt loam or silty clay loam. It is mildly alkaline or moderately alkaline. Loamy glacial till is below a depth of 40 inches in some pedons.

Oahe Series

The Oahe series consists of well drained soils that are moderately deep over gravelly material. These soils formed in loamy material over gravelly sand. They are on outwash plains and terraces. Permeability is moderate in the loamy material and rapid in the underlying material. Slopes range from 0 to 6 percent.

Oahe soils are similar to Delmont and Ree soils and are near Delmont, Ree, and Schamber soils. Delmont and Schamber soils are less than 20 inches deep to gravelly material. Schamber soils are on ridges and knolls. Ree soils have an argillic horizon and are more than 40 inches deep to gravelly material.

Typical pedon of Oahe loam, 0 to 2 percent slopes (fig. 12), 264 feet west and 528 feet north of the southeast corner of sec. 22, T. 117 N., R. 74 W.

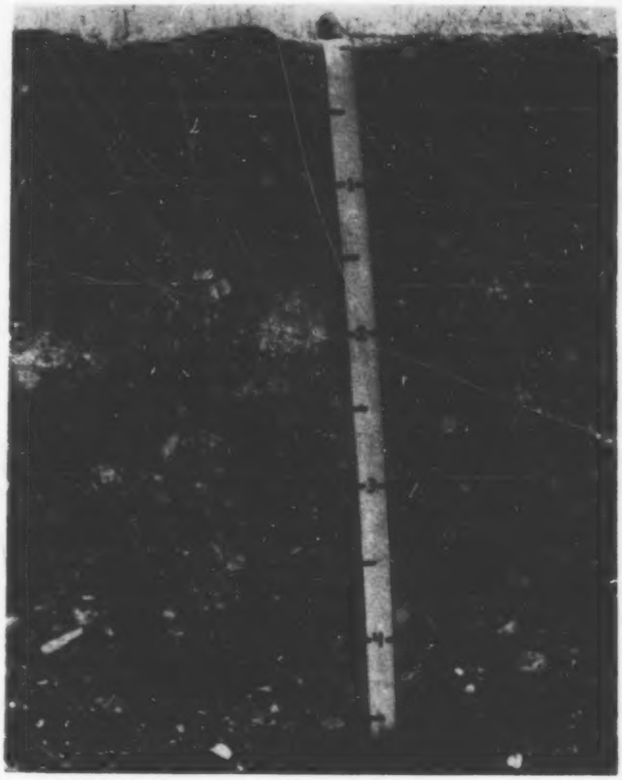

Figure 12.—Profile of Oahe loam, 0 to 2 percent slopes, which is moderately deep over gravelly material.

Ap—0 to 5 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak fine granular structure; slightly hard, very friable; many roots; neutral; abrupt smooth boundary.

Bw1—5 to 9 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable; many roots; neutral; clear wavy boundary.

Bw2—9 to 14 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to weak coarse subangular blocky; hard, very friable; common roots; neutral; clear wavy boundary.

Ck—14 to 22 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, very friable; few roots; common fine accumulations of carbonate; violent effervescence; mildly alkaline; abrupt irregular boundary.

2C—22 to 60 inches; multicolored gravelly sand; single grain; loose; numerous fine shale chips; violent effervescence; mildly alkaline.

The thickness of the solum and the depth to free carbonates range from 10 to 20 inches. The depth to gravelly material ranges from 20 to 40 inches. The thickness of the mollic epipedon ranges from 12 to 20 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is slightly acid or neutral. It is 3 to 7 inches thick. The Bw horizon has hue of 10YR or 2.5Y, value of 3 to 5 (2 or 3 moist), and chroma of 1 or 2. It is loam or clay loam. It is neutral or mildly alkaline. Some pedons have a BCk horizon. The Ck horizon has hue of 2.5Y or 10YR, value of 5 or 6 (4 or 5 moist), and chroma of 2 or 3. It is mildly alkaline or moderately alkaline. The 2C horizon is stratified sand and gravel or gravelly sand. It is mildly alkaline or moderately alkaline.

Okaton Series

The Okaton series consists of shallow, well drained soils that formed in clayey shale residuum. These soils are on the breaks along Lake Oahe. Permeability is slow. Slopes range from 15 to 40 percent.

Okaton soils are similar to Sansarc soils and are near Opal and Sansarc soils. Opal soils are 20 to 40 inches deep to shale. They are lower on the landscape than the Okaton soils. Sansarc soils have a lower content of free carbonates and more clay than the Okaton soils.

Typical pedon of Okaton silty clay, 15 to 40 percent slopes, 50 feet west and 1,635 feet south of the northeast corner of sec. 2, T. 120 N., R. 78 W.

A—0 to 4 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak very fine granular structure; slightly hard, friable; common roots; strong effervescence; mildly alkaline; clear wavy boundary.

AC—4 to 12 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak fine granular structure; slightly hard, friable; common roots; strong effervescence; mildly alkaline; gradual wavy boundary.

C—12 to 16 inches; light brownish gray (2.5Y 6/2) very shaly clay, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable; common roots; few brown (7.5YR 4/4) iron stains; few gypsum crystals; strong effervescence; mildly alkaline; abrupt wavy boundary.

Cr—16 to 60 inches; light brownish gray (2.5Y 6/2) shale, grayish brown (2.5Y 5/2) moist; few roots; few brown (7.5YR 4/4) iron stains; few gypsum crystals between shale plates; strong effervescence; mildly alkaline.

The depth to shale ranges from 8 to 20 inches. The soil and the underlying shale are mildly alkaline or moderately alkaline throughout.

The A horizon has hue of 10YR or 2.5Y, value of 5 to 7 (3 to 5 moist), and chroma of 2 or 3. It dominantly is silty clay, but in some pedons it is clay. It is 1 to 4 inches thick. The Cr horizon has hue of 10YR or 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4.

Opal Series

The Opal series consists of moderately deep, well drained soils that formed in material weathered from clayey shale on uplands. When dry, these soils are characterized by cracks, which are 0.5 inch to 2.0 inches wide and several feet long and extend through the subsoil. Permeability is very slow. Slopes range from 2 to 25 percent.

Opal soils are similar to Promise soils and commonly are near Hurley, Okaton, Promise, and Sansarc soils. Hurley soils have a natric horizon. They are on foot slopes and in swales. Promise soils are more than 40 inches deep to shale. Okaton and Sansarc soils are less than 20 inches deep to shale. They are on the steeper parts of the landscape.

Typical pedon of Opal clay, 2 to 6 percent slopes, 950 feet east and 2,218 feet north of the southwest corner of sec. 23, T. 120 N., R. 77 W.

A—0 to 4 inches; dark gray (5Y 4/1) clay, very dark gray (5Y 3/1) moist; moderate fine granular structure; hard, firm; many roots; neutral; abrupt smooth boundary.

Bw—4 to 14 inches; dark gray (5Y 4/1) clay, very dark gray (5Y 3/1) moist; moderate medium prismatic structure parting to weak medium subangular blocky; very hard, firm; common roots; moderately alkaline; gradual wavy boundary.

BCk—14 to 21 inches; gray (5Y 5/1) clay, dark gray (5Y 4/1) moist; few very dark gray tongues of the A horizon; weak medium prismatic structure parting to weak medium subangular blocky; very hard, firm; few roots; few fine accumulations of carbonate; slight effervescence; moderately alkaline; clear smooth boundary.

C—21 to 32 inches; gray (5Y 5/1) very shaly clay, dark gray (5Y 4/1) moist; many fine faint olive gray (5Y 5/2) mottles; massive; very hard, firm; about 60 percent fragments of shale; slight effervescence; mildly alkaline; clear smooth boundary.

Cr—32 to 60 inches; gray (5Y 5/1) shale, dark gray (5Y 4/1) moist; few fine faint olive gray (5Y 5/2) mottles; brittle; moderately alkaline.

The thickness of the solum ranges from 15 to 27 inches. The depth to free carbonates ranges from 4 to 16 inches. The thickness of the mollic epipedon ranges from 7 to 16 inches. The depth to shale ranges from 20 to 40 inches.

The A horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 or 5 (2 or 3 moist), and chroma of 1 or 2. It dominantly is clay, but in some pedons it is silty clay. It is 4 to 6 inches thick. It is neutral or mildly alkaline. The Bw horizon has hue of 2.5Y or 5Y, value of 4 to 6 (3 or 4 moist), and chroma of 1 or 2. It is mildly alkaline or moderately alkaline. The C horizon has hue of 2.5Y or 5Y, value of 5 or 6 (4 or 5 moist), and chroma of 1 to 3. It is mildly alkaline or moderately alkaline. The Cr horizon has colors similar to those in the C horizon. It ranges from neutral to moderately alkaline. Few to many relic mottles and gypsum crystals are between the shale plates in some pedons.

Peno Series

The Peno series consists of deep, well drained soils that formed in loamy glacial till on uplands. Permeability is moderately slow. Slopes range from 2 to 15 percent.

Peno soils are similar to Raber soils and are near Eakin, Gettys, Highmore, Lowry, and Raber soils. Eakin and Highmore soils contain less clay and more silt in the argillic horizon than the Peno soils. Also, they are on smoother parts of the landscape. Gettys soils do not have a mollic epipedon. They are on the steeper parts of the landscape. Lowry soils do not have an argillic horizon and contain more silt and less clay throughout than the Peno soils. They are on the less sloping parts of the landscape. Raber soils have a thicker solum and are leached of free carbonates to a greater depth than the Peno soils.

Typical pedon of Peno loam, in an area of Lowry-Peno complex, 9 to 15 percent slopes, 1,360 feet east and 2,045 feet north of the southwest corner of sec. 14, T. 118 N., R. 78 W.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; slightly hard, friable; many roots; neutral; abrupt smooth boundary.

Bt—4 to 9 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; hard, firm; many roots; neutral; clear wavy boundary.

BCk—9 to 15 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse subangular blocky structure parting to weak fine and medium subangular blocky; hard, firm; common roots; many medium and coarse accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

Ck—15 to 25 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; hard, firm; few roots; few shale chips; many medium and fine accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

C—25 to 60 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm; few roots; few brown (7.5YR 4/4) iron stains; few shale chips; few fine accumulations of carbonate; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 10 to 20 inches. The depth to free carbonates ranges from 6 to 11 inches. The thickness of the mollic epipedon ranges from 7 to 11 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is 2 to 4 inches thick. It is loam, clay loam, or stony loam. It is slightly acid or neutral. The Bt horizon has value of 4 or 5 (2 to 4 moist) and chroma of 1 or 2. It is clay loam or clay that averages as low as 35 percent clay in some pedons and as high as 45 percent clay in others. It is neutral or mildly alkaline. The C horizon has hue of 10YR or 2.5Y, value of 5 or 6 (4 or 5 moist), and chroma of 2 or 3. It is clay loam or clay. It is moderately alkaline or strongly alkaline.

Plankinton Series

The Plankinton series consists of deep, poorly drained soils that formed in local alluvial sediments over loamy glacial till. These soils are in depressions on uplands. Permeability is very slow. Slopes are 0 to 1 percent.

Plankinton soils are similar to Hoven soils and are near Glenham, Hoven, and Tetonka soils. The well drained Glenham soils are higher on the landscape than the Plankinton soils. Hoven soils have a natric horizon. Tetonka soils have a surface soil that is thicker than that of the Plankinton soils. They are in positions on the landscape similar to those of the Plankinton soils.

Typical pedon of Plankinton silt loam, in an area of Glenham-Plankinton complex, 0 to 4 percent slopes, 100 feet south and 860 feet west of the northeast corner of sec. 8, T. 120 N., R. 73 W.

Ap—0 to 4 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, very friable; common roots; neutral; abrupt smooth boundary.

E—4 to 7 inches; gray (10YR 6/1 and 10YR 5/1) silt loam, dark gray (10YR 4/1) moist; weak thin and medium platy structure parting to weak fine subangular blocky; soft, very friable; common roots; few fine dark concretions (iron and manganese oxide); neutral; abrupt smooth boundary.

Bt1—7 to 12 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; common roots; few fine dark concretions (iron and manganese oxide); neutral; clear wavy boundary.

Bt2—12 to 28 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; few roots; slightly acid; gradual wavy boundary.

BCkg—28 to 39 inches; dark gray (10YR 4/1) clay loam, very dark grayish brown (10YR 3/2) moist; weak medium and coarse prismatic structure parting to weak medium subangular blocky; hard, firm; few roots; common fine accumulations of carbonate; strong effervescence; mildly alkaline; gradual wavy boundary.

Ckg—39 to 53 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; common fine distinct light olive brown (2.5Y 5/4) mottles; weak medium and fine subangular blocky structure; hard, friable; common fine accumulations of carbonate; strong effervescence; moderately alkaline; clear wavy boundary.

Cg—53 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; many fine and medium distinct light olive brown (2.5Y 5/4) mottles; massive; hard, friable; few small shale chips; few fine accumulations of carbonate; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 30 to 45 inches. The depth to free carbonates ranges from 24 to 40 inches. The thickness of the mollic epipedon ranges from 28 to 50 inches.

The A horizon has value of 4 or 5 (2 or 3 moist). It is 3 to 6 inches thick. It ranges from medium acid to neutral. The E horizon has value of 5 to 7 (4 or 5 moist). It is 2 to 4 inches thick. It ranges from medium acid to neutral. The Bt horizon has hue of 10YR or 2.5Y and value of 4 or 5 (2 or 3 moist). It is clay or silty clay. It ranges from slightly acid to moderately alkaline. The C horizon has hue of 2.5Y or 5Y, value of 5 to 7 (3 to 5 moist), and chroma of 1 to 4. It is clay, silty clay, silty clay loam, or clay loam. It is mildly alkaline or moderately alkaline.

Promise Series

The Promise series consists of deep, well drained soils that formed in clayey material on uplands. When dry, these soils are characterized by cracks, which are 0.5 inch to 2.0 inches wide and several feet long and extend through the subsoil. Permeability is very slow. Slopes range from 0 to 6 percent.

Promise soils are similar to Opal soils and are near Hurley and Opal soils. Hurley soils have a natric horizon. They are lower on the landscape than the Promise soils. Opal soils are 20 to 40 inches deep to shale.

Typical pedon of Promise clay, 0 to 2 percent slopes, 2,545 feet west and 112 feet south of the northeast corner of sec. 29, T. 120 N., R. 77 W.

A—0 to 5 inches; dark grayish brown (2.5Y 4/2) clay, very dark grayish brown (2.5Y 3/2) moist; moderate medium and fine subangular blocky structure parting to moderate fine granular; hard, firm; many roots; slight effervescence; slightly acid; clear wavy boundary.

Bw—5 to 13 inches; dark grayish brown (2.5Y 4/2) clay, very dark grayish brown (2.5Y 3/2) moist; weak coarse prismatic structure parting to weak coarse and medium subangular blocky; very hard, firm; many roots; slight effervescence; moderately alkaline; gradual wavy boundary.

BCk—13 to 25 inches; olive gray (5Y 5/2) clay, olive gray (5Y 4/2) moist; few very dark grayish brown tongues of the A horizon; weak coarse prismatic structure parting to weak coarse subangular blocky; extremely hard, firm; common roots; common fine and medium accumulations of carbonate; slight effervescence; moderately alkaline; gradual wavy boundary.

C—25 to 34 inches; olive gray (5Y 5/2) clay, olive gray (5Y 4/2) moist; few very dark grayish brown tongues of the A horizon; massive; extremely hard, firm; few roots; few fine accumulations of carbonate; slight effervescence; moderately alkaline; gradual wavy boundary.

Cy—34 to 43 inches; olive gray (5Y 5/2) clay, olive gray (5Y 4/2) moist; massive; very hard, firm; common brown (7.5YR 4/4) iron stains; many gypsum crystals; slight effervescence; mildly alkaline; gradual wavy boundary.

C'—43 to 60 inches; olive gray (5Y 5/2) clay, olive gray (5Y 4/2) moist; massive; very hard, firm; few brown (7.5YR 4/4) iron stains; mildly alkaline.

The thickness of the solum ranges from 20 to 40 inches. The depth to free carbonates ranges from 0 to 8 inches. The thickness of the mollic epipedon ranges from 7 to 15 inches.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5 (2 or 3 moist), and chroma of 1 or 2. It dominantly is clay, but in some pedons it is silty clay. It ranges from slightly acid to mildly alkaline. It is 4 to 7 inches thick. The Bw horizon has hue of 2.5Y or 5Y, value of 4 or 5 (3 or 4 moist), and chroma of 1 or 2. It is mildly alkaline or moderately alkaline. The C horizon has hue of 2.5Y or 5Y, value of 5 or 6 (4 or 5 moist), and chroma of 2 or 3. It ranges from mildly alkaline to strongly alkaline. Shale bedrock is at a depth of 40 to 60 inches in some pedons.

Prosper Series

The Prosper series consists of deep, moderately well drained soils that formed in loamy alluvium over glacial till. These soils are in swales on uplands. Permeability is moderate in the solum and moderately slow in the underlying glacial till. Slopes range from 0 to 2 percent.

Prosper soils are similar to Mobridge soils and are near Glenham, Java, Plankinton, and Tetonka soils. The well drained Glenham and Java soils are on convex uplands. Mobridge soils contain less sand and more silt throughout than the Prosper soils. The poorly drained Plankinton and Tetonka soils are in depressions.

Typical pedon of Prosper loam, in an area of Glenham-Prosper loams, 0 to 3 percent slopes, 335 feet west and 55 feet north of the southeast corner of sec. 10, T. 119 N., R. 73 W.

Ap—0 to 7 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable; many roots; medium acid; abrupt smooth boundary.

A—7 to 13 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak medium and coarse subangular blocky structure parting to weak fine granular; slightly hard, friable; many roots; neutral; clear wavy boundary.

Bt1—13 to 22 inches; dark grayish brown (10YR 4/2) clay loam, very dark brown (10YR 2/2) moist; weak medium prismatic structure parting to moderate medium and coarse subangular blocky; hard, friable; common roots; neutral; gradual wavy boundary.

Bt2—22 to 29 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to moderate medium and coarse subangular blocky; very hard, friable; common roots; neutral; gradual wavy boundary.

BCk—29 to 36 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; very hard, friable; common roots; few fine accumulations of carbonate; strong effervescence; mildly alkaline; gradual wavy boundary.

Ck1—36 to 44 inches; light yellowish brown (2.5Y 6/4) clay loam, olive brown (2.5Y 4/4) moist; few fine distinct gray (10YR 5/1) mottles; massive; very hard, friable; few fine accumulations of carbonate; strong effervescence; mildly alkaline; gradual wavy boundary.

Ck2—44 to 60 inches; light yellowish brown (2.5Y 6/4) clay loam, olive brown (2.5Y 4/4) moist; few fine distinct gray (10YR 5/1) and few fine prominent yellowish brown (10YR 5/6) mottles; massive; very hard, friable; common fine and few medium accumulations of carbonate; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 24 to 40 inches. The depth to free carbonates ranges from 25 to 35 inches. The thickness of the mollic epipedon ranges from 20 to 30 inches.

The A horizon has value of 3 or 4 (2 or 3 moist) and chroma of 1 or 2. It is 10 to 13 inches thick. It ranges from medium acid to mildly alkaline. The Bt horizon has hue of 10YR or 2.5Y, value of 3 to 5 (2 to 4 moist), and chroma of 1 to 3. It is neutral or mildly alkaline. The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4. It is mildly alkaline or moderately alkaline.

Raber Series

The Raber series consists of deep, well drained soils that formed in loamy glacial till on uplands. Permeability is moderately slow. Slopes range from 0 to 15 percent.

Raber soils are similar to Glenham and Peno soils and are near Cavo, Gettys, Jerauld, and Peno soils. Cavo and Jerauld soils have a natric horizon. They are slightly lower on the landscape than the Raber soils. Gettys soils have carbonates at or near the surface. They are on the steeper slopes. Glenham soils contain less clay in the subsoil than the Raber soils. Peno soils have a solum that is thinner than that of the Raber soils and have free carbonates within a depth of 11 inches.

Typical pedon of Raber loam, 2 to 6 percent slopes, 2,110 feet west and 2,445 feet north of the southeast corner of sec. 15, T. 118 N., R. 74 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark gray (10YR 3/1) moist; moderate fine and medium subangular blocky structure parting to weak fine granular; slightly hard, friable; many roots; neutral; clear smooth boundary.

Bt1—4 to 9 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky; hard, firm; common roots; neutral; clear smooth boundary.

Bt2—9 to 15 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm; common roots; neutral; clear wavy boundary.

BCk—15 to 27 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse prismatic structure parting to weak fine and medium subangular blocky; very hard, firm; few roots; common medium and coarse accumulations of carbonate; few fine and medium brown (7.5YR 4/4) iron stains; few shale chips; strong effervescence; moderately alkaline; gradual wavy boundary.

Ck—27 to 38 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm; few roots; few fine and medium accumulations of carbonate; few fine brown (7.5YR 4/4) iron stains; few shale chips; strong effervescence; moderately alkaline; gradual wavy boundary.

C—38 to 60 inches; pale olive (5Y 6/3) clay loam, olive (5Y 4/3) moist; massive; hard, firm; common medium brown (7.5YR 4/4) iron stains; few shale chips; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 22 to 35 inches. The depth to free carbonates ranges from 12 to 20 inches. The thickness of the mollic epipedon ranges from 7 to 16 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It dominantly is loam, but in some pedons it is clay loam. It is slightly acid or neutral. It is 3 to 6 inches thick. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5 (2 to 4 moist), and chroma of 2 or 3. It is clay loam or clay. It is neutral or mildly alkaline. The C horizon has hue of 2.5Y or 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4. It is clay loam or clay. It is mildly alkaline or moderately alkaline.

Ranslo Series

The Ranslo series consists of deep, somewhat poorly drained soils that formed in loamy and silty alluvium on flood plains. Permeability is slow. Slopes range from 0 to 2 percent.

Ranslo soils are near Durrstein and Regan soils. The poorly drained Durrstein soils are slightly lower on the flood plains than the Ranslo soils. The very poorly drained Regan soils do not have a natric horizon. They are in positions on the landscape similar to those of the Ranslo soils.

Typical pedon of Ranslo silt loam, in an area of Ranslo-Durrstein silt loams, 915 feet west and 220 feet north of the southeast corner of sec. 28, T. 119 N., R. 74 W.

A1—0 to 4 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine granular structure; soft, friable; many roots; medium acid; clear smooth boundary.

A2—4 to 9 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure parting to weak fine granular; slightly hard, friable; many roots; slightly acid; clear smooth boundary.

Bt—9 to 16 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; weak medium and coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, firm; few roots; neutral; clear wavy boundary.

Btz—16 to 20 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium prismatic structure parting to moderate fine subangular blocky; hard, firm; few roots; few fine nests of salts; mildly alkaline; clear wavy boundary.

BCkz—20 to 25 inches; dark grayish brown (2.5Y 4/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium and coarse subangular blocky structure parting to moderate fine and medium subangular blocky; hard, firm; few roots; common fine accumulations of carbonate; common fine nests of salts; slight effervescence; strongly alkaline; clear wavy boundary.

Ckzg—25 to 44 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm; few roots; common fine accumulations of carbonate; few fine nests of salts; strong effervescence; strongly alkaline; gradual wavy boundary.

Cg—44 to 60 inches; light yellowish brown (2.5Y 6/4) sandy clay loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, firm; slight effervescence; strongly alkaline.

The thickness of the solum and the thickness of the mollic epipedon range from 20 to 30 inches. The depth to free carbonates ranges from 10 to 25 inches. The sodium adsorption ratio in the subsoil ranges from about 13 to 25.

The A horizon has value of 4 or 5 (2 or 3 moist). It ranges from medium acid to neutral. It is 5 to 10 inches thick. The Bt horizon has hue of 10YR or 2.5Y, value of 3 to 5 (2 or 3 moist), and chroma of 1 or 2. It is clay loam or clay. It ranges from neutral to moderately alkaline. The C horizon has hue of 2.5Y or 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 1 to 4. It is clay loam or clay. It ranges from mildly alkaline to strongly alkaline. Some pedons have a 2C horizon. This horizon has hue of 2.5Y or 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 1 to 4. It is sandy clay loam or gravelly sand.

Ree Series

The Ree series consists of deep, well drained soils that formed in loamy alluvium over gravelly sand. These soils are on terraces. Permeability is moderate. Slopes range from 0 to 2 percent.

Ree soils are similar to Oahe soils and are near Oahe and Ranslo soils. Oahe soils are 20 to 40 inches deep to gravelly material. Ranslo soils have a natric horizon and are not underlain by gravelly material. They are slightly lower on the landscape than the Ree soils.

Typical pedon of Ree loam, 0 to 2 percent slopes, 430 feet north and 210 feet east of the southwest corner of sec. 14, T. 117 N., R. 74 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loam, very dark gray (10YR 3/1) moist; weak fine and medium subangular blocky structure parting to weak fine granular; slightly hard, friable; many roots; neutral; abrupt smooth boundary.

Bt—7 to 18 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, friable; many roots; neutral; gradual wavy boundary.

BC—18 to 23 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; hard, friable; few roots; mildly alkaline; clear wavy boundary.

Ck—23 to 36 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; hard, friable; few roots; many fine and medium accumulations of carbonate; violent effervescence; moderately alkaline; gradual wavy boundary.

C1—36 to 50 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, friable; few roots; few fine accumulations of carbonate; strong effervescence; moderately alkaline; abrupt wavy boundary.

2C2—50 to 60 inches; multicolored gravelly sand; single grain; loose; slight effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 40 inches. The depth to free carbonates ranges from 12 to 30 inches. The thickness of the mollic epipedon ranges from 7 to 20 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. It is 4 to 12 inches thick. It is slightly acid or neutral. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5 (3 or 4 moist), and chroma of 1 to 4. It is neutral or mildly alkaline. The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4. It is mildly alkaline or moderately alkaline. The 2C horizon also is mildly alkaline or moderately alkaline.

Regan Series

The Regan series consists of deep, very poorly drained soils that formed in silty alluvium on flood plains, in valleys, and in outwash channels. Permeability is moderate. Slopes are less than 1 percent.

Regan soils are near Davison, Durrstein, and Ranslo soils. The moderately well drained Davison soils contain more sand throughout than the Regan soils. Durrstein and Ranslo soils have a natric horizon. All of the nearby soils are in positions on the landscape similar to those of the Regan soils.

Typical pedon of Regan silt loam, 2,375 feet north and 2,110 feet east of the southwest corner of sec. 35, T. 119 N., R. 74 W.

A—0 to 7 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; slightly hard, friable; many roots; strong effervescence; moderately alkaline; abrupt wavy boundary.

Ckg1—7 to 15 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak very coarse subangular blocky structure parting to weak medium and fine subangular blocky; slightly hard, friable; many roots; violent effervescence; moderately alkaline; gradual wavy boundary.

Ckg2—15 to 21 inches; light gray (10YR 6/1) silt loam, very dark gray (10YR 3/1) moist; weak very coarse subangular blocky structure parting to weak medium and coarse subangular blocky; slightly hard, friable; many roots; violent effervescence; moderately alkaline; gradual wavy boundary.

Cg—21 to 60 inches; light gray (10YR 7/1) silt loam, gray (10YR 5/1) moist; massive; slightly hard, friable; violent effervescence; moderately alkaline.

Free carbonates are at or near the surface. The soils range from mildly alkaline to strongly alkaline throughout.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is 4 to 8 inches thick. Some pedons have an AC horizon. The C horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 7 (3 to 5 moist), and chroma of 1 or 2. It is silt loam or silty clay loam. Clay loam glacial till is below a depth of 40 inches in some pedons.

Sansarc Series

The Sansarc series consists of shallow, well drained soils that formed in clayey shale residuum on the breaks along Lake Oahe. Permeability is slow. Slopes range from 9 to 40 percent.

Sansarc soils are similar to Okaton soils and commonly are near Betts, Okaton, and Opal soils. The deep, loamy Betts soils formed in glacial till. They are on the higher parts of the landscape. Okaton soils contain less clay than the Sansarc soils. Opal soils have a mollic epipedon and are 20 to 40 inches deep to shale. They are on smooth slopes.

Typical pedon of Sansarc clay, 15 to 40 percent slopes, 100 feet north and 1,850 feet east of the southwest corner of sec. 17, T. 117 N., R. 79 W.

A—0 to 4 inches; olive gray (5Y 5/2) clay, dark olive gray (5Y 3/2) moist; moderate medium granular structure; slightly hard, friable; many roots; slight effervescence; neutral; abrupt smooth boundary.

AC—4 to 7 inches; olive gray (5Y 5/2) shaly clay, olive gray (5Y 4/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; many roots; slight effervescence; mildly alkaline; clear wavy boundary.

C—7 to 15 inches; light olive gray (5Y 6/2) shaly clay, olive gray (5Y 4/2) moist; massive; slightly hard, friable; many roots; few fine brown (7.5YR 4/4) iron stains; slight effervescence; mildly alkaline; gradual wavy boundary.

Cr—15 to 60 inches; light olive gray (5Y 6/2) shale, olive gray (5Y 4/2) moist; few roots to a depth of 34 inches; few fine brown (7.5YR 4/4) iron stains; shale can be dug easily, but shale fragments are hard and brittle when dry; slight effervescence; mildly alkaline.

The depth to shale ranges from 6 to 20 inches. The A horizon has hue of 2.5Y, 5Y, or 10YR and value of 4 to 6 (3 or 4 moist). It dominantly is clay, but in some pedons it is shaly clay or silty clay. It is 2 to 4 inches thick. It ranges from neutral to moderately alkaline. The C horizon has hue of 2.5Y or 5Y and value of 5 to 7 (4 or 5 moist). It is clay, shaly clay, or very shaly clay. It is mildly alkaline or moderately alkaline. The Cr horizon has hue of 2.5Y or 5Y and value of 5 to 7 (4 or 5 moist). It is medium acid to moderately alkaline. Seams of gypsum, carbonates, and other salts are in the cracks and seams of the shale in some pedons.

Schamber Series

The Schamber series consists of excessively drained soils that are very shallow over gravelly sand. These soils formed in gravelly outwash on uplands. Permeability is rapid. Slopes range from 6 to 60 percent.

The Schamber soils in this county receive somewhat more precipitation than is definitive for the series.

Schamber soils are near Betts, Delmont, and Oahe soils. Betts soils formed in loamy glacial till. They are in positions on the landscape similar to those of the Schamber soils. Delmont and Oahe soils are deeper to gravelly material than the Schamber soils. Also, they are lower on the landscape.

Typical pedon of Schamber gravelly loam, in an area of Delmont-Schamber complex, 6 to 15 percent slopes, 695 feet east and 165 feet north of the southwest corner of sec. 28, T. 120 N., R. 74 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; loose, very friable; common roots; slight effervescence; mildly alkaline; clear smooth boundary.

C—4 to 60 inches; multicolored very gravelly sand; single grain; loose; few roots to a depth of 9 inches; strong effervescence; moderately alkaline.

The depth to gravelly material ranges from 4 to 10 inches. Free carbonates are leached to a depth of several inches in some pedons.

The A horizon has value of 5 or 6 (3 to 5 moist) and chroma of 2 to 4. It dominantly is gravelly loam, but in some pedons it is gravelly sandy loam or very gravelly loam. It is 4 to 10 inches thick. It ranges from slightly acid to moderately alkaline. The C horizon is mildly alkaline or moderately alkaline.

Tetonka Series

The Tetonka series consists of deep, poorly drained soils that formed in local alluvium over glacial till. These soils are in depressions on uplands. Permeability is very slow. Slopes are 0 to 1 percent.

Tetonka soils are similar to Worthing soils and are near Agar, Glenham, Mobridge, Plankinton, and Raber soils. The well drained Agar, Glenham, and Raber soils are on uplands. The moderately well drained Mobridge soils are in swales. Plankinton soils have a surface soil that is thinner than that of the Tetonka soils. They are in positions on the landscape similar to those of the Tetonka soils. Worthing soils are very poorly drained.

Typical pedon of Tetonka silt loam, 225 feet north and 150 feet east of the southwest corner of sec. 4, T. 117 N., R. 78 W.

Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak medium subangular blocky structure parting to moderate fine granular; slightly hard, very friable; many roots; medium acid; abrupt smooth boundary.

E—7 to 14 inches; light gray (10YR 7/1) and gray (10YR 6/1) silt loam, dark gray (10YR 4/1) moist; weak medium platy structure; slightly hard, very friable; many roots; neutral; abrupt smooth boundary.

Bt1—14 to 25 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; common roots; few fine dark concretions (iron and manganese oxide); neutral; gradual wavy boundary.

Bt2—25 to 39 inches; grayish brown (10YR 5/2) clay, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to moderate medium and fine blocky; hard, firm; common roots; few fine dark concretions (iron and manganese oxide); neutral; gradual wavy boundary.

BCg—39 to 47 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; few grayish brown (10YR 5/2) coatings on faces of peds; strong coarse prismatic structure parting to strong medium blocky; hard, firm; few roots; neutral; gradual wavy boundary.

Ckg—47 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; hard, friable; few roots to a depth of 50 inches; strong effervescence; mildly alkaline.

The thickness of the solum and the depth to free carbonates range from 40 to 60 inches. The thickness of the mollic epipedon ranges from 24 to 50 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is 6 to 12 inches thick. It is medium acid to neutral. The E horizon has value of 5 to 7 (4 or 5 moist) and chroma of 1 or 2. It is 5 to 10 inches thick. It is medium acid to neutral. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5 (2 or 3 moist), and chroma of 1 or 2. It is clay, silty clay, silty clay loam, or clay loam. It is slightly acid to mildly alkaline. The C horizon has hue of 2.5Y or 5Y, value of 5 or 6 (4 or 5 moist), and chroma of 1 or 2. It is clay, silty clay, silty clay loam, or clay loam. It is mildly alkaline or moderately alkaline.

Walke Series

The Walke series consists of deep, moderately well drained soils that formed in silty material on uplands. Permeability is moderately slow. Slopes range from 0 to 2 percent.

Walke soils are similar to Cavo and DeGrey soils and commonly are near Agar, DeGrey, Highmore, and Mobridge soils. Cavo and DeGrey soils have columnar structure in the Bt horizon. Agar, Highmore, and Mobridge soils do not have a natric horizon. Agar and Highmore soils are slightly higher on the landscape than the Walke soils. Mobridge soils are in swales.

Typical pedon of Walke silt loam, 1,190 feet east and 1,220 feet south of the northwest corner of sec. 34, T. 117 N., R. 77 W.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, very dark gray (10YR 3/1) moist; weak very fine granular structure; soft, very friable; many roots; slightly acid; clear wavy boundary.

A2—4 to 8 inches; dark grayish brown (10YR 4/2) silt loam, very dark gray (10YR 3/1) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; soft, very friable; many roots; neutral; clear wavy boundary.

BE—8 to 11 inches; grayish brown (10YR 5/2) silty clay loam (B), very dark grayish brown (10YR 3/2) moist; light gray (10YR 6/1) coatings on faces of peds (E); weak medium prismatic structure parting to moderate medium and coarse subangular blocky; hard, friable; many roots; neutral; clear wavy boundary.

Bt—11 to 18 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; strong coarse prismatic structure parting to strong medium and coarse subangular blocky; hard, firm; many roots; mildly alkaline; gradual wavy boundary.

BCk—18 to 27 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse prismatic structure parting to weak medium subangular blocky; hard, firm; common roots; many fine and medium accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

Ck—27 to 52 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; few roots to a depth of 45 inches; many fine and medium accumulations of carbonate; strong effervescence; moderately alkaline; gradual wavy boundary.

C—52 to 60 inches; brown (10YR 5/3) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable; slight effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 33 inches. The depth to free carbonates ranges from 12 to 24 inches. The thickness of the mollic epipedon ranges from 7 to 19 inches. The sodium adsorption ratio in the subsoil ranges from about 10 to 20.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is 5 to 10 inches thick. It is slightly acid or neutral. Some pedons have an E horizon. The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5 (3 or 4 moist), and chroma of 2 or 3. It is neutral to moderately alkaline. It is silty clay loam or silty clay that averages as low as 35 percent clay in some pedons and as high as 50 percent clay in others. Also, the content of sand coarser than very fine sand is less than 15 percent. The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 (3 to 5 moist), and chroma of 1 to 3. It is silty clay loam, silt loam, or loam. It is mildly alkaline or moderately alkaline. Some pedons have a 2C horizon, which is loam or clay loam.

Wendte Series

The Wendte series consists of deep, moderately well drained soils that formed in loamy and clayey alluvium on flood plains and stream terraces. When dry, these soils are characterized by cracks, which are 0.5 inch to 2.0 inches wide and several feet long and extend into the underlying material. Permeability is slow. Slopes range from 0 to 2 percent.

Wendte soils are near Hurley and Promise soils. The nearby soils are on uplands. Hurley soils have a natric horizon. Promise soils are not stratified.

Typical pedon of Wendte silty clay loam, channeled, 83 feet north and 2,305 feet east of the southwest corner of sec. 11, T. 118 N., R. 78 W.

A—0 to 5 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; weak thin platy structure parting to weak fine granular; slightly hard, firm; many roots; mildly alkaline; abrupt smooth boundary.

C1—5 to 15 inches; dark gray (10YR 4/1) clay loam that has thin strata of sand; very dark gray (10YR 3/1), moist; weak medium and coarse subangular blocky structure; slightly hard, firm; many roots; slight effervescence; mildly alkaline; abrupt smooth boundary.

C2—15 to 32 inches; gray (10YR 5/1) silty clay that has thin strata of sand; very dark gray (10YR 3/1) moist; thin laminations; hard, firm; common roots; slight effervescence; mildly alkaline; abrupt smooth boundary.

C3—32 to 60 inches; gray (10YR 5/1) silty clay loam that has thin strata of fine sand and gravel; very dark gray (10YR 3/1) moist; appears massive but has distinct bedding planes; hard, firm; few roots to a depth of 34 inches; mildly alkaline.

The 10- to 40-inch control section averages as low as 45 percent clay in some pedons and as high as 55 percent clay in others. The depth to free carbonates ranges from 3 to 6 inches. The soils are mildly alkaline or moderately alkaline throughout.

The A horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 or 5 (2 or 3 moist), and chroma of 1 or 2. It dominantly is silty clay loam, but in some pedons it is clay, silty clay, or clay loam. It is 5 to 7 inches thick. The C horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 7 (3 to 6 moist), and chroma of 1 to 4. It is stratified clay, silty clay loam, clay loam, or silty clay. Some pedons have thin layers of coarser textures in the lower part of the C horizon.

Worthing Series

The Worthing series consists of deep, very poorly drained soils that formed in clayey alluvium in depressions on uplands. Permeability is slow. Slopes are 0 to 1 percent.

Worthing soils are similar to Tetonka soils and are near Glenham, Hoven, and Raber soils. The well drained Glenham and Raber soils are on uplands. Hoven soils have a natric horizon. They are in positions on the landscape similar to those of the Worthing soils. The poorly drained Tetonka soils have a light gray E horizon.

Typical pedon of Worthing silty clay loam, 335 feet east and 1,730 feet north of the southwest corner of sec. 11, T. 119 N., R. 73 W.

A—0 to 9 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; many fine prominent dark yellowish brown (10YR 4/4) mottles; moderate fine granular structure; hard, firm; many roots; medium acid; clear wavy boundary.

Btg1—9 to 26 inches; dark gray (10YR 4/1) clay, black (10YR 2/1) moist; weak medium and coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, firm; few fine dark concretions (iron and manganese oxide); many roots; slightly acid; gradual wavy boundary.

Btg2—26 to 44 inches; gray (10YR 5/1) clay, very dark gray (10YR 3/1) moist; moderate coarse prismatic structure parting to strong medium and coarse subangular blocky; hard, firm; common fine and medium dark concretions (iron and manganese oxide); many roots to a depth of 38 inches, common roots to a depth of 44 inches; slightly acid; gradual wavy boundary.

BCg—44 to 56 inches; gray (5Y 5/1) silty clay, dark gray (5Y 4/1) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, firm; few roots to a depth of 55 inches; mildly alkaline; gradual wavy boundary.

Ckg—56 to 60 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm; few threads of carbonate; slight effervescence; mildly alkaline.

The thickness of the solum and thickness of the mollic epipedon range from 35 to 60 inches. The depth to free carbonates ranges from 40 to 60 inches.

The A horizon has hue of 10YR, 2.5Y, or 5Y and value of 3 or 4 (2 or 3 moist). It dominantly is silty clay loam, but in some pedons it is silty clay or silt loam. It is medium acid to neutral. It is 8 to 20 inches thick. The Bt horizon has hue of 10YR, 2.5Y, or 5Y and value of 3 to 5 (2 or 3 moist). It is silty clay or clay that averages as low as 40 percent clay in some pedons and as high as 55 percent clay in others. It is slightly acid or neutral. The C horizon has hue of 2.5Y or 5Y, value of 4 to 8 (3 to 6 moist), and chroma of 1 or 2. It is silty clay, silty clay loam, or clay loam. It is neutral to moderately alkaline.

Formation of the Soils

Soil forms when chemical and physical processes act on geologically deposited or accumulated material. The characteristics of the soil at any given point are determined by the physical and minerological composition of the parent material, the climate under which the soil material has accumulated and existed since accumulation, the plant and animal life on and in the soil, the relief, and the length of time that the forces of soil formation have acted on the soil material.

Climate and plant and animal life, chiefly plants, are active factors of soil formation. They act on the parent material and slowly change it to a natural body that has genetically related horizons. The effects of climate and plant and animal life are conditioned by relief. The parent material affects the kind of soil profile that forms and, in extreme cases, determines it almost entirely. Finally, time is needed for changing the parent material into a soil having genetically related horizons. Usually, a long time is required for development of distinct horizons.

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made regarding the effect of any one factor unless conditions are specified for the other four. The following paragraphs relate the factors of soil formation to the soils in Potter County.

Climate

Climate directly influences the rate of chemical and physical weathering. Potter County has a continental climate marked by cold winters and hot summers. This climate favors the growth of grasses and the resulting accumulation of organic matter in the upper part of the soil. The precipitation is sufficient to leach carbonates in most soils to an average depth of about 16 inches. The climate is generally uniform throughout the county and thus as a separate factor does not differentiate the soils within the county. Additional climatic data are given under the heading "General Nature of the County."

Plant and Animal Life

Plants, animals, insects, earthworms, bacteria, and fungi have an important effect on soil formation. They cause gains in organic matter, gains or losses in plant nutrients, and changes in soil structure and porosity. In Potter County the tall and mid prairie grasses have had more influence than other living organisms on soil formation. As a result of these grasses, the surface layer of many soils has a moderate or high content of organic matter. Mobridge soils are an example.

Earthworms, insects, and burrowing animals help to keep the soil open and porous. Bacteria and fungi decompose plant residue, thus releasing plant nutrients.

Parent Material

Many of the soils in Potter County formed in glacial material derived from preglacial formations of granite gneiss, limestone, sandstone, and shale. The glacier ground up and mixed these materials as it transported them. It then redeposited them as it melted. Some deposits consist of material sorted either by water as the material was deposited or by wind and water after it was deposited; others consist of unsorted material, or glacial till.

The glacial till in Potter County can generally be classified as loamy glacial till and silty glacial till. The silty glacial till is confined to the central part of the county. The loamy glacial till is in the eastern part of the county and includes the area known as the Lebanon Hills. It generally has scattered stones and boulders throughout.

The silty glacial till was deposited on glacial ice and then reworked by water as the glacier melted. Highmore soils formed in silty glacial till. Eakin soils formed in a thin mantle of silty glacial till over loamy glacial till. Loamy glacial till is a mixture of clay, silt, sand, and gravel and few to many cobblestones and boulders. It has a higher content of pebbles and cobblestones than the silty glacial till. The proportion of each kind of material is determined by the kind of material picked up by the glacier. Among the soils formed in loamy glacial till are Betts, Java, and Glenham soils.

Glacial outwash is sandy, gravelly, and loamy material deposited by glacial melt water. Delmont and Oahe soils formed in loamy material underlain by sand and gravel within a depth of 40 inches. Most soils that formed in glacial outwash are on terraces along Okobojo Creek and the drainageway that flows through Lebanon and Hoven (*5*).

Loess mantles the uplands in areas above the breaks adjacent to Lake Oahe. Agar and Lowry soils formed in this silty loess.

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Soils on the lower part of the breaks along Lake Oahe formed in material weathered from clay shale. Opal and Sansarc soils are examples.

Mobridge, Prosper, and Tetonka are examples of soils that formed partly or entirely in local alluvium washed in from sloping soils on adjacent uplands. Bon soils formed in alluvium deposited by streams.

Relief

Relief affects soil formation through its effect on drainage, runoff, erosion, plant cover, and soil temperature. On the steeper soils, such as Betts soils, much of the rainfall runs off the surface. Because of the excessive runoff, a limited amount of moisture penetrates the surface. Much of the surface soil is lost through erosion. As a result, these soils have a thin surface layer and are calcareous at or near the surface. Runoff is slower on Agar and Glenham soils than on the Betts soils. As a result, more moisture penetrates the surface and the layers in which organic matter accumulates are thicker. Also, calcium carbonate is leached to a depth of more than 10 inches.

Mobridge and Prosper soils are in swales that receive extra moisture in the form of runoff from adjacent soils. The layers in which organic matter accumulates are thicker than those in the Agar and Glenham soils. Also, calcium carbonate is leached to a greater depth. The seasonal high water table in Durrstein and other soils that are in areas where drainage is impeded favors the concentration of salts.

Time

The length of time that the climate, plant and animal life, and relief have affected the parent material helps to determine the kind of soil that forms. The youngest soils are those on active flood plains, such as Bon soils.

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Glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour farming. Growing crops in rows or strips that follow the contour.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial melt water.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water through cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability the soil may not adequately filter effluent from a waste disposal system.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor, on the basis of how much the present plant community has departed from the potential. *Excellent* indicates that more than 75 percent of the present plant community is the potential natural plant community; *good*, 50 to 75 percent; *fair*, 25 to 50 percent; and *poor*, less than 25 percent.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4

Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called groundwater runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Slickspot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multipled by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. The slope classes recognized in this survey are—

	Percent
Level	0 to 1
Nearly level or gently undulating	0 to 3
Gently sloping or undulating	2 to 6
Moderately sloping or gently rolling	6 to 9
Strongly sloping or rolling	9 to 15
Moderately steep or hilly	15 to 25
Steep	25 to 40
Very steep	more than 40

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Data were recorded in the period 1951-79 at Gettysburg, South Dakota]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	21.6	0.9	11.3	51	-28	0	0.40	0.11	0.63	2	3.9
February---	28.9	7.6	18.3	59	-22	19	.59	.23	.89	2	6.8
March------	39.2	17.3	28.3	72	-13	60	.90	.24	1.42	3	7.2
April------	56.4	31.8	44.1	86	10	183	2.10	.78	3.20	5	3.7
May--------	69.3	42.8	56.1	91	25	499	2.92	1.53	4.13	6	.1
June-------	79.0	53.2	66.1	99	37	783	3.37	1.69	4.84	7	.0
July-------	87.2	58.3	72.8	105	44	1,017	2.03	1.08	2.86	5	.0
August-----	86.3	56.4	71.4	104	41	973	2.39	.94	3.60	5	.0
September--	74.9	45.6	60.3	100	26	609	1.27	.37	1.99	3	.0
October----	62.3	34.9	48.6	91	16	296	1.00	.26	1.59	3	1.1
November---	42.1	20.3	31.2	71	-6	35	.63	.12	1.02	2	2.8
December---	28.8	8.8	18.8	61	-23	19	.56	.16	.88	2	5.5
Yearly:											
Average--	56.3	31.5	43.9	---	---	---	---	---	---	---	---
Extreme--	---	---	---	106	-29	---	---	---	---	---	---
Total----	---	---	---	---	---	4,493	18.16	14.18	21.97	45	31.1

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data were recorded in the period 1951-79 at Gettysburg, South Dakota]

Probability	Minimum temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 5	May 17	May 25
2 years in 10 later than--	May 1	May 11	May 20
5 years in 10 later than--	April 21	May 1	May 11
First freezing temperature in fall:			
1 year in 10 earlier than--	October 3	September 26	September 13
2 years in 10 earlier than--	October 8	September 30	Septmeber 18
5 years in 10 earlier than--	October 18	October 9	September 27

TABLE 3.--GROWING SEASON

[Data were recorded in the period 1951-79 at Gettysburg, South Dakota]

Probability	Length of growing season if daily minimum temperature is--		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	161	139	119
8 years in 10	167	146	126
5 years in 10	179	160	139
2 years in 10	191	174	152
1 year in 10	197	181	158

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AgA	Agar silt loam, 0 to 2 percent slopes	21,290	3.8
AgB	Agar silt loam, 2 to 6 percent slopes	17,540	3.2
AmA	Agar-Mobridge silt loams, 0 to 3 percent slopes	22,700	4.1
AoA	Agar-Mobridge-Tetonka silt loams, 0 to 3 percent slopes	3,420	0.6
BgE	Betts-Gettys complex, stony, 15 to 60 percent slopes	3,930	0.7
BkE	Betts-Java loams, 9 to 25 percent slopes	10,670	1.9
Bo	Bon loam	620	0.1
Bv	Bon loam, channeled	1,430	0.3
CaA	Cavo loam, 0 to 2 percent slopes	2,400	0.4
Da	Davison loam	930	0.2
De	DeGrey silt loam	6,840	1.2
DmA	Delmont loam, 0 to 2 percent slopes	1,080	0.2
DsD	Delmont-Schamber complex, 6 to 15 percent slopes	1,940	0.4
Du	Durrstein silt loam	3,160	0.6
EaA	Eakin silt loam, 0 to 2 percent slopes	15,150	2.7
EpB	Eakin-Peno complex, 2 to 6 percent slopes	27,560	5.0
EpC	Eakin-Peno complex, 6 to 9 percent slopes	2,670	0.5
GeF	Gettys clay loam, 25 to 40 percent slopes	3,500	0.6
GlA	Glenham loam, 0 to 2 percent slopes	2,850	0.5
GpB	Glenham-Plankinton complex, 0 to 4 percent slopes	10,190	1.8
GrA	Glenham-Prosper loams, 0 to 3 percent slopes	17,570	3.2
GrB	Glenham-Prosper loams, 1 to 6 percent slopes	2,670	0.5
HbA	Highmore silt loam, 0 to 2 percent slopes	45,230	8.3
HbB	Highmore silt loam, 2 to 6 percent slopes	42,260	7.6
HbC	Highmore silt loam, 6 to 9 percent slopes	2,290	0.4
HdA	Highmore-DeGrey silt loams, 0 to 2 percent slopes	4,950	0.9
HfA	Highmore-Mobridge silt loams, 0 to 3 percent slopes	33,620	6.1
HgB	Highmore-Peno complex, stony, 2 to 6 percent slopes	5,200	0.9
HgC	Highmore-Peno complex, stony, 6 to 9 percent slopes	3,570	0.6
Ho	Hoven silt loam	8,000	1.4
Hu	Hurley silt loam	2,100	0.4
Hz	Hurley-Slickspots complex	800	0.1
JbC	Java-Betts loams, 6 to 9 percent slopes	21,730	3.9
JgB	Java-Glenham loams, 2 to 6 percent slopes	39,440	7.1
JmE	Java-Schamber complex, 9 to 25 percent slopes	1,490	0.3
Jr	Jerauld silt loam	1,270	0.2
LoA	Lowry silt loam, 0 to 2 percent slopes	2,520	0.5
LoB	Lowry silt loam, 2 to 6 percent slopes	5,480	1.0
LoC	Lowry silt loam, 6 to 9 percent slopes	3,210	0.6
LpC	Lowry-Peno complex, 6 to 9 percent slopes	1,100	0.2
LpD	Lowry-Peno complex, 9 to 15 percent slopes	1,140	0.2
Mo	Mobridge silt loam	25,260	4.6
OaA	Oahe loam, 0 to 2 percent slopes	12,340	2.2
OaB	Oahe loam, 2 to 6 percent slopes	2,170	0.4
OdB	Oahe-Delmont loams, 2 to 6 percent slopes	1,900	0.3
OkF	Okaton silty clay, 15 to 40 percent slopes	2,330	0.4
OpB	Opal clay, 2 to 6 percent slopes	8,900	1.6
OpC	Opal clay, 6 to 9 percent slopes	2,770	0.5
OsD	Opal-Sansarc clays, 9 to 25 percent slopes	7,220	1.3
Pa	Pits, gravel	100	*
Pk	Plankinton silt loam	4,500	0.8
PrA	Promise clay, 0 to 2 percent slopes	7,690	1.4
PrB	Promise clay, 2 to 6 percent slopes	3,100	0.6
RaA	Raber loam, 0 to 2 percent slopes	3,000	0.5
RaB	Raber loam, 2 to 6 percent slopes	11,240	2.0
RcA	Raber-Cavo loams, 0 to 2 percent slopes	2,770	0.5
RcB	Raber-Cavo loams, 2 to 6 percent slopes	2,080	0.4
RgD	Raber-Gettys complex, 9 to 25 percent slopes	6,650	1.2
RhC	Raber-Peno loams, 6 to 9 percent slopes	5,100	0.9
Rn	Ranslo silt loam	530	0.1
Rr	Ranslo-Durrstein silt loams	1,820	0.3
RsA	Ree loam, 0 to 2 percent slopes	1,930	0.3
Rt	Regan silt loam	500	0.1
SaF	Sansarc clay, 15 to 40 percent slopes	17,560	3.2
ScF	Schamber gravelly loam, 15 to 60 percent slopes	940	0.2
Te	Tetonka silt loam	4,780	0.9
Wa	Walke silt loam	2,070	0.4
Wf	Wendte silty clay loam, channeled	550	0.1
Wo	Worthing silty clay loam	6,230	1.1
Wp	Worthing silty clay loam, ponded	950	0.2

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
	Water less than 40 acres	1,477	0.3
	Total land area	553,967	100.0
	Open water areas more than 40 acres in size	20,279	
	Total area	574,246	

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

[Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name]

Map symbol	Soil name
AgA	Agar silt loam, 0 to 2 percent slopes (where irrigated)
AgB	Agar silt loam, 2 to 6 percent slopes (where irrigated)
AmA	Agar-Mobridge silt loams, 0 to 3 percent slopes (where irrigated)
Bo	Bon loam
Da	Davison loam (where irrigated)
EaA	Eakin silt loam, 0 to 2 percent slopes (where irrigated)
GlA	Glenham loam, 0 to 2 percent slopes (where irrigated)
GrA	Glenham-Prosper loams, 0 to 3 percent slopes (where irrigated)
GrB	Glenham-Prosper loams, 1 to 6 percent slopes (where irrigated)
HbA	Highmore silt loam, 0 to 2 percent slopes (where irrigated)
HbB	Highmore silt loam, 2 to 6 percent slopes (where irrigated)
HfA	Highmore-Mobridge silt loams, 0 to 3 percent slopes (where irrigated)
JgB	Java-Glenham loams, 2 to 6 percent slopes (where irrigated)
LoA	Lowry silt loam, 0 to 2 percent slopes (where irrigated)
LoB	Lowry silt loam, 2 to 6 percent slopes (where irrigated)
Mo	Mobridge silt loam
OaA	Oahe loam, 0 to 2 percent slopes (where irrigated)
OaB	Oahe loam, 2 to 6 percent slopes (where irrigated)
RsA	Ree loam, 0 to 2 percent slopes (where irrigated)

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Land capability	Corn	Oats	Winter wheat	Alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
AgA Agar	IIc-2	49	60	34	2.1	3.5
AgB Agar	IIe-1	46	56	32	2.0	3.3
AmA		52	62	37	2.5	4.2
Agar	IIc-2					
Mobridge	IIc-3					
AoA		46	52	32	2.4	4.0
Agar	IIc-2					
Mobridge	IIc-3					
Tetonka	IVw-1					
BgE Betts-Gettys	VIIs-6	---	---	---	---	---
BkE Betts-Java	VIe-3	---	---	---	---	---
Bo Bon	IIc-3	55	68	41	3.1	5.2
Bv Bon	VIw-1	---	---	---	2.8	4.7
CaA Cavo	IVs-2	16	29	18	1.2	2.0
Da Davison	IIe-4	47	59	30	2.4	4.0
De DeGrey	IVs-2	17	28	20	1.1	1.8
DmA Delmont	IVs-1	18	32	---	1.1	1.8
DsD		---	---	---	---	---
Delmont	VIe-5					
Schamber	VIs-4					
Du Durrstein	VIw-4	---	---	---	---	---
EaA Eakin	IIc-2	48	59	34	2.1	3.5
EpB		40	49	31	1.8	3.1
Eakin	IIe-1					
Peno	IIIe-3					
EpC		31	42	26	1.5	2.7
Eakin	IIIe-1					
Peno	IVe-3					
GeF Gettys	VIIe-3	---	---	---	---	---
GlA Glenham	IIc-2	48	56	32	2.1	3.5
GpB		35	42	25	2.1	3.5
Glenham	IIe-2					
Plankinton	IVw-1					

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Oats	Winter wheat	Alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
GrA		52	61	35	2.5	4.1
Glenham	IIc-2					
Prosper	IIc-3					
GrB		47	59	33	2.2	3.9
Glenham	IIe-2					
Prosper	IIc-3					
HbA Highmore	IIc-2	50	60	34	2.1	3.5
HbB Highmore	IIe-1	47	56	32	2.0	3.3
HbC Highmore	IIIe-1	34	50	28	1.7	2.8
HdA		32	49	28	1.7	3.0
Highmore	IIc-2					
DeGrey	IVs-2					
HfA		53	62	37	2.5	4.2
Highmore	IIc-2					
Mobridge	IIc-3					
HgB		---	---	---	---	---
Highmore	IIe-1					
Peno	VIIs-6					
HgC		---	---	---	---	---
Highmore	IIIe-1					
Peno	VIIs-6					
Ho Hoven	VIs-1	---	---	---	---	---
Hu Hurley	VIs-1	---	---	---	---	---
Hz		---	---	---	---	---
Hurley	VIs-1					
Slickspots	VIIIs-3					
JbC Java-Betts	IVe-3	18	36	---	1.2	2.0
JgB		37	46	28	1.9	3.1
Java	IIIe-12					
Glenham	IIe-2					
JmE		---	---	---	---	---
Java	VIe-3					
Schamber	VIs-4					
Jr Jerauld	VIs-1	---	---	---	---	---
LoA Lowry	IIc-2	48	50	33	1.8	3.3
LoB Lowry	IIe-1	45	46	32	1.7	3.2
LoC Lowry	IIIe-1	30	41	27	1.5	3.0
LpC		29	40	24	1.5	2.8
Lowry	IIIe-1					
Peno	IVe-3					

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Oats	Winter wheat	Alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
LpD		---	---	---	---	---
Lowry	IVe-1					
Peno	VIe-3					
Mo	IIc-3	55	65	41	3.0	5.0
Mobridge						
OaA	IIIs-2	30	44	---	1.3	2.2
Oahe						
OaB	IIIe-6	28	41	---	1.2	2.0
Oahe						
OdB		18	36	---	1.1	1.8
Oahe	IIIe-6					
Delmont	IVe-6					
OkF	VIIe-8	---	---	---	---	---
Okaton						
OpB	IIIe-4	25	41	29	1.4	2.3
Opal						
OpC	IVe-4	21	33	26	1.3	2.2
Opal						
OsD		---	---	---	1.1	1.8
Opal	VIe-4					
Sansarc	VIe-12					
Pa**	VIIIs-2					
Pits						
Pk	IVw-1	15	---	---	2.3	3.8
Plankinton						
PrA	IIIs-3	28	50	32	1.5	2.5
Promise						
PrB	IIIe-4	27	48	31	1.5	2.5
Promise						
RaA	IIc-2	38	49	31	2.0	3.3
Raber						
RaB	IIe-2	36	48	29	2.0	3.3
Raber						
RcA		20	43	28	1.7	2.8
Raber	IIc-2					
Cavo	IVs-2					
RcB		19	42	26	1.7	2.8
Raber	IIe-2					
Cavo	IVs-3					
RgD		---	---	---	---	---
Raber	IVe-1					
Gettys	VIe-3					
RhC		19	41	23	1.7	2.8
Raber	IIIe-2					
Peno	IVe-3					
Rn	IIIw-4	---	---	---	2.2	3.5
Ranslo						
Rr		---	---	---	1.7	2.8
Ranslo	IIIw-4					
Durrstein	VIw-4					

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Oats	Winter wheat	Alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
RsA------------------------ Ree	IIc-2	48	55	34	1.8	3.0
Rt------------------------- Regan	Vw-4	---	---	---	---	---
SaF------------------------ Sansarc	VIIe-8	---	---	---	---	---
ScF------------------------ Schamber	VIIs-4	---	---	---	---	---
Te------------------------- Tetonka	IVw-1	16	---	---	2.4	4.0
Wa------------------------- Walke	IIIs-1	30	45	30	1.7	2.8
Wf------------------------- Wendte	VIw-1	---	---	---	2.5	4.2
Wo------------------------- Worthing	Vw-4	---	---	---	---	---
Wp------------------------- Worthing	VIIIw-1	---	---	---	---	---

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* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--RANGELAND PRODUCTIVITY

[Only the soils that support rangeland vegetation suitable for grazing are listed]

Soil name and map symbol	Range site	Potential annual production for kind of growing season		
		Favorable Lb/acre	Average Lb/acre	Unfavorable Lb/acre
AgA, AgB Agar	Silty	3,300	2,800	2,000
AmA*:				
Agar	Silty	3,300	2,800	2,000
Mobridge	Overflow	4,600	3,800	2,700
AoA*:				
Agar	Silty	3,300	2,800	2,000
Mobridge	Overflow	4,600	3,800	2,700
Tetonka	Wet Meadow	4,100	3,700	2,600
BgE*:				
Betts	Thin Upland	2,200	1,800	1,300
Gettys	Thin Upland	2,600	2,200	1,500
BkE*:				
Betts	Thin Upland	2,800	2,300	1,600
Java	Silty	3,100	2,600	1,800
Bo Bon	Overflow	4,200	3,800	3,000
Bv Bon	Overflow	4,600	4,200	3,400
CaA Cavo	Claypan	2,500	2,100	1,500
Da Davison	Limy Subirrigated	4,300	3,600	2,500
De DeGrey	Claypan	2,500	2,100	1,500
DmA Delmont	Shallow to Gravel	2,200	1,800	1,100
DsD*:				
Delmont	Shallow to Gravel	1,800	1,500	900
Schamber	Very Shallow	1,400	1,200	700
Du Durrstein	Saline Lowland	3,300	3,000	2,400
EaA Eakin	Silty	3,400	2,800	2,000
EpB*, EpC*:				
Eakin	Silty	3,400	2,800	2,000
Peno	Clayey	2,900	2,400	1,700
GeF Gettys	Thin Upland	2,900	2,400	1,700
GlA Glenham	Silty	3,400	2,800	2,000

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY--Continued

Soil name and map symbol	Range site	Potential annual production for kind of growing season		
		Favorable Lb/acre	Average Lb/acre	Unfavorable Lb/acre
GpB*:				
Glenham	Silty	3,400	2,800	2,000
Plankinton	Closed Depression	3,700	3,300	2,300
GrA*, GrB*:				
Glenham	Silty	3,400	2,800	2,000
Prosper	Overflow	4,700	4,300	3,000
HbA, HbB, HbC Highmore	Silty	3,500	2,900	2,000
HdA*:				
Highmore	Silty	3,500	2,900	2,000
DeGrey	Claypan	2,500	2,100	1,500
HfA*:				
Highmore	Silty	3,500	2,900	2,000
Mobridge	Overflow	4,600	3,800	2,700
HgB*, HgC*:				
Highmore	Silty	3,500	2,900	2,000
Peno	Clayey	2,900	2,400	1,700
Ho Hoven	Closed Depression	3,600	3,300	2,300
Hu Hurley	Thin Claypan	1,600	1,300	500
Hz*:				
Hurley	Thin Claypan	1,600	1,300	500
Slickspots.				
JbC*:				
Java	Silty	3,100	2,600	1,800
Betts	Thin Upland	2,900	2,400	1,700
JgB*:				
Java	Silty	3,100	2,600	1,800
Glenham	Silty	3,400	2,800	2,000
JmE*:				
Java	Silty	3,100	2,600	1,800
Schamber	Very Shallow	1,400	1,200	700
Jr Jerauld	Thin Claypan	1,700	1,400	1,000
LoA, LoB, LoC Lowry	Silty	2,900	2,400	1,700
LpC*, LpD*:				
Lowry	Silty	2,800	2,300	1,600
Peno	Clayey	2,900	2,400	1,700
Mo Mobridge	Overflow	4,600	3,800	2,700

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY--Continued

Soil name and map symbol	Range site	Potential annual production for kind of growing season		
		Favorable Lb/acre	Average Lb/acre	Unfavorable Lb/acre
OaA, OaB Oahe	Silty	3,100	2,600	1,800
OdB*:				
Oahe	Silty	3,100	2,600	1,800
Delmont	Shallow to Gravel	2,200	1,800	1,100
OkF Okaton	Shallow	2,200	1,800	1,300
OpB, OpC Opal	Clayey	2,800	2,300	1,600
OsD*:				
Opal	Clayey	2,300	1,900	1,300
Sansarc	Shallow Clay	1,900	1,600	1,100
Pk Plankinton	Closed Depression	3,700	3,300	2,300
PrA, PrB Promise	Clayey	2,800	2,500	1,800
RaA, RaB Raber	Clayey	3,100	2,600	1,800
RcA*, RcB*:				
Raber	Clayey	3,100	2,600	1,800
Cavo	Claypan	2,500	2,100	1,500
RgD*:				
Raber	Clayey	3,100	2,600	1,800
Gettys	Thin Upland	2,900	2,400	1,700
RhC*:				
Raber	Clayey	3,100	2,600	1,800
Peno	Clayey	2,900	2,400	1,700
Rn Ranslo	Subirrigated	4,800	4,400	3,500
Rr*:				
Ranslo	Subirrigated	4,800	4,400	3,500
Durrstein	Saline Lowland	3,300	3,000	2,400
RsA Ree	Silty	3,300	2,800	2,000
Rt Regan	Wetland	6,000	5,700	5,400
SaF Sansarc	Shallow Clay	1,900	1,600	1,100
ScF Schamber	Very Shallow	1,400	1,200	700
Te Tetonka	Wet Meadow	4,100	3,700	2,600
Wa Walke	Clayey	3,100	2,600	1,800

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY--Continued

Soil name and map symbol	Range site	Potential annual production for kind of growing season		
		Favorable Lb/acre	Average Lb/acre	Unfavorable Lb/acre
Wf------------------------ Wendte	Clayey Overflow-------------------------	3,000	2,500	1,750
Wo------------------------ Worthing	Shallow Marsh---------------------------	6,400	5,800	4,600

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

[The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil]

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of—				
	<8	8-15	16-25	26-35	>35
AgA, AgB---------- Agar	Lilac, Tatarian honeysuckle.	Eastern redcedar, Siberian peashrub, common chokecherry.	Ponderosa pine, honeylocust, green ash, Russian-olive, bur oak, hackberry.	Siberian elm------	---
AmA*: Agar-------------	Lilac, Tatarian honeysuckle.	Eastern redcedar, Siberian peashrub, common chokecherry.	Ponderosa pine, honeylocust, green ash, Russian-olive, bur oak, hackberry.	Siberian elm------	---
Mobridge---------	Lilac-------------	Tatarian honeysuckle, Siberian peashrub, American plum.	Ponderosa pine, blue spruce, green ash, hackberry, eastern redcedar.	---	Eastern cottonwood.
AoA*: Agar-------------	Lilac, Tatarian honeysuckle.	Eastern redcedar, Siberian peashrub, common chokecherry.	Ponderosa pine, honeylocust, green ash, Russian-olive, bur oak, hackberry.	Siberian elm------	---
Mobridge---------	Lilac-------------	Tatarian honeysuckle, Siberian peashrub, American plum.	Ponderosa pine, blue spruce, green ash, hackberry, eastern redcedar.	---	Eastern cottonwood.
Tetonka.					
BgE*: Betts.					
Gettys.					
BkE*: Betts.					
Java.					
Bo, Bv------------ Bon	Lilac-------------	Siberian peashrub, American plum, Tatarian honeysuckle.	Hackberry, green ash, blue spruce, ponderosa pine, eastern redcedar.	---	Eastern cottonwood.
CaA--------------- Cavo	Eastern redcedar, Rocky Mountain juniper, Siberian peashrub, silver buffaloberry, lilac.	Siberian elm, green ash, ponderosa pine, Russian-olive.	---	---	---

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
Da---------------- Davison	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Russian-olive, bur oak, green ash, hackberry, ponderosa pine.	Siberian elm------	---
De---------------- DeGrey	Eastern redcedar, Rocky Mountain juniper, Siberian peashrub, silver buffaloberry, lilac.	Siberian elm, green ash, ponderosa pine, Russian-olive.	---	---	---
DmA--------------- Delmont	Lilac, Peking cotoneaster.	Eastern redcedar, Rocky Mountain juniper, ponderosa pine, Siberian peashrub, green ash, Russian-olive.	Siberian elm------	---	---
DsD*: Delmont.					
Schamber.					
Du. Durrstein					
EaA--------------- Eakin	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, bur oak, Black Hills spruce, Russian-olive, green ash, hackberry.	Siberian elm------	---
EpB*, EpC*: Eakin------------	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, bur oak, Black Hills spruce, Russian-olive, green ash, hackberry.	Siberian elm------	---
Peno-------------	American plum, lilac.	Hackberry, Russian-olive, Siberian crabapple, eastern redcedar, Rocky Mountain juniper, Siberian peashrub, Tatarian honeysuckle.	Siberian elm, ponderosa pine, green ash.	---	---
GeF. Gettys					
GlA--------------- Glenham	---	Russian-olive, eastern redcedar, common chokecherry, Siberian peashrub, American plum, Tatarian honeysuckle, lilac.	Ponderosa pine, green ash, Black Hills spruce, Siberian crabapple.	Siberian elm------	---

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
GpB*: Glenham----------	---	Russian-olive, eastern redcedar, common chokecherry, Siberian peashrub, American plum, Tatarian honeysuckle, lilac.	Ponderosa pine, green ash, Black Hills spruce, Siberian crabapple.	Siberian elm------	---
Plankinton.					
GrA*, GrB*: Glenham----------	---	Russian-olive, eastern redcedar, common chokecherry, Siberian peashrub, American plum, Tatarian honeysuckle, lilac.	Ponderosa pine, green ash, Black Hills spruce, Siberian crabapple.	Siberian elm------	---
Prosper----------	---	Common chokecherry, Siberian peashrub, American plum, lilac.	Blue spruce, green ash, hackberry, Siberian crabapple, eastern redcedar, ponderosa pine.	Golden willow-----	Eastern cottonwood.
HbA, HbB, HbC----- Highmore	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, bur oak, Black Hills spruce, Russian-olive, green ash, hackberry.	Siberian elm------	---
HdA*: Highmore---------	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, bur oak, Black Hills spruce, Russian-olive, green ash, hackberry.	Siberian elm------	---
DeGrey-----------	Eastern redcedar, Rocky Mountain juniper, Siberian peashrub, silver buffaloberry, lilac.	Siberian elm, green ash, ponderosa pine, Russian-olive.	---	---	---
HfA*: Highmore---------	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, bur oak, Black Hills spruce, Russian-olive, green ash, hackberry.	Siberian elm------	---
Mobridge---------	Lilac-------------	Tatarian honeysuckle, Siberian peashrub, American plum.	Ponderosa pine, blue spruce, green ash, hackberry, eastern redcedar.	---	Eastern cottonwood.

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
HgB*, HgC*: Highmore----------	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, bur oak, Black Hills spruce, Russian-olive, green ash, hackberry.	Siberian elm------	---
Peno.					
Ho. Hoven					
Hu. Hurley					
Hz*: Hurley.					
Slickspots.					
JbC*: Java--------------	Siberian peashrub, silver buffaloberry, American plum, lilac, golden currant.	Russian-olive, ponderosa pine, eastern redcedar, hackberry, Rocky Mountain juniper.	Siberian elm------	---	---
Betts-------------	Siberian peashrub, silver buffaloberry, American plum, lilac, golden currant.	Ponderosa pine, Russian-olive, green ash, hackberry, Rocky Mountain juniper, eastern redcedar.	Siberian elm------	---	---
JgB*: Java--------------	Siberian peashrub, silver buffaloberry, American plum, lilac, golden currant.	Russian-olive, ponderosa pine, eastern redcedar, hackberry, Rocky Mountain juniper.	Siberian elm------	---	---
Glenham-----------	---	Russian-olive, eastern redcedar, common chokecherry, Siberian peashrub, American plum, Tatarian honeysuckle, lilac.	Ponderosa pine, green ash, Black Hills spruce, Siberian crabapple.	Siberian elm------	---
JmE*: Java.					
Schamber.					
Jr. Jerauld					
LoA, LoB, LoC----- Lowry	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, bur oak, Black Hills spruce, Russian-olive, green ash, hackberry.	Siberian elm------	---

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
LpC*, LpD*:					
Lowry	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, bur oak, Black Hills spruce, Russian-olive, green ash, hackberry.	Siberian elm	---
Peno	American plum, lilac.	Hackberry, Russian-olive, Siberian crabapple, eastern redcedar, Rocky Mountain juniper, Siberian peashrub, Tatarian honeysuckle.	Siberian elm, ponderosa pine, green ash.	---	---
Mo Mobridge	Lilac	Tatarian honeysuckle, Siberian peashrub, American plum.	Ponderosa pine, blue spruce, green ash, hackberry, eastern redcedar.	---	Eastern cottonwood.
OaA, OaB Oahe	Lilac, Peking cotoneaster.	Ponderosa pine, green ash, Siberian peashrub, Rocky Mountain juniper, Russian-olive, eastern redcedar.	Siberian elm	---	---
OdB*:					
Oahe	Lilac, Peking cotoneaster.	Ponderosa pine, green ash, Siberian peashrub, Rocky Mountain juniper, Russian-olive, eastern redcedar.	Siberian elm	---	---
Delmont	Lilac, Peking cotoneaster.	Eastern redcedar, Rocky Mountain juniper, ponderosa pine, Siberian peashrub, green ash, Russian-olive.	Siberian elm	---	---
OkF. Okaton					
OpB, OpC Opal	Silver buffaloberry, American plum.	Eastern redcedar, Siberian crabapple, common chokecherry, Siberian peashrub, Tatarian honeysuckle, lilac, ponderosa pine, Russian-olive.	Siberian elm, green ash.	---	---

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
OsD*: Opal.					
Sansarc.					
Pa*. Pits					
Pk. Plankinton					
PrA, PrB---------- Promise	American plum, Tatarian honeysuckle, Siberian peashrub, lilac.	Hackberry, Russian-olive, eastern redcedar, Siberian crabapple, Rocky Mountain juniper, ponderosa pine.	Green ash, Siberian elm.	---	---
RaA, RaB---------- Raber	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, green ash, hackberry, Russian-olive, Black Hills spruce, bur oak.	Siberian elm------	---
RcA*, RcB*: Raber------------	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, green ash, hackberry, Russian-olive, Black Hills spruce, bur oak.	Siberian elm------	---
Cavo-------------	Eastern redcedar, Rocky Mountain juniper, Siberian peashrub, silver buffaloberry, lilac.	Siberian elm, green ash, ponderosa pine, Russian-olive.	---	---	---
RgD*: Raber------------	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, green ash, hackberry, Russian-olive, Black Hills spruce, bur oak.	Siberian elm------	---
Gettys.					
Raber------------	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, green ash, hackberry, Russian-olive, Black Hills spruce, bur oak.	Siberian elm------	---
RhC*: Peno-------------	American plum, lilac.	Hackberry, Russian-olive, Siberian crabapple, eastern redcedar, Rocky Mountain juniper, Siberian peashrub, Tatarian honeysuckle.	Siberian elm, ponderosa pine, green ash.	---	---

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
Rn----------------- Ranslo	Siberian peashrub, American plum.	Common chokecherry, lilac, Black Hills spruce, Siberian crabapple, eastern redcedar.	Blue spruce, ponderosa pine green ash.	Golden willow-----	Plains cottonwood.
Rr*:					
Ranslo-----------	Siberian peashrub, American plum.	Common chokecherry, lilac, Black Hills spruce, Siberian crabapple, eastern redcedar.	Blue spruce, ponderosa pine, green ash.	Golden willow-----	Plains cottonwood.
Durrstein.					
RsA--------------- Ree	Tatarian honeysuckle, lilac.	Eastern redcedar, common chokecherry, Siberian peashrub.	Ponderosa pine, green ash, hackberry, Russian-olive, bur oak.	Siberian elm------	---
Rt. Regan					
SaF. Sansarc					
ScF. Schamber					
Te. Tetonka					
Wa----------------- Walke	Lilac, American plum.	Ponderosa pine, hackberry, eastern redcedar, Rocky Mountain juniper, Russian-olive, Siberian crabapple, Siberian peashrub, Tatarian honeysuckle.	Siberian elm, green ash.	---	---
Wf----------------- Wendte	Siberian peashrub, Tatarian honeysuckle, lilac, American plum.	Hackberry, eastern redcedar, Rocky Mountain juniper, Russian-olive, Siberian crabapple, ponderosa pine.	Siberian elm, green ash.	---	---
Wo----------------- Worthing	Lilac-------------	Common chokecherry, Siberian peashrub, Tatarian honeysuckle.	Hackberry, green ash, ponderosa pine, eastern redcedar.	Golden willow, silver maple.	Eastern cottonwood.
Wp. Worthing					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
AgA Agar	Slight	Slight	Slight	Slight.
AgB Agar	Slight	Slight	Moderate: slope.	Slight.
AmA*:				
Agar	Slight	Slight	Slight	Slight.
Mobridge	Severe: flooding.	Slight	Moderate: flooding.	Slight.
AoA*:				
Agar	Slight	Slight	Slight	Slight.
Mobridge	Severe: flooding.	Slight	Moderate: flooding.	Slight.
Tetonka	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.
BgE*:				
Betts	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Gettys	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BkE*:				
Betts	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Java	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Bo Bon	Severe: flooding.	Slight	Moderate: flooding.	Slight.
Bv Bon	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: flooding.
CaA Cavo	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
Da Davison	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight.
De DeGrey	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
DmA Delmont	Slight	Slight	Slight	Slight.
DsD*:				
Delmont	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Schamber	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Du Durrstein	Severe: flooding, wetness, percs slowly.	Severe: wetness, excess sodium, excess salt.	Severe: wetness, percs slowly.	Severe: wetness.
EaA Eakin	Slight	Slight	Slight	Slight.
EpB*:				
Eakin	Slight	Slight	Moderate: slope.	Slight.
Peno	Slight	Slight	Moderate: slope.	Slight.
EpC*:				
Eakin	Slight	Slight	Severe: slope.	Slight.
Peno	Slight	Slight	Severe: slope.	Slight.
GeF Gettys	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
GlA Glenham	Slight	Slight	Slight	Slight.
GpB*:				
Glenham	Slight	Slight	Moderate: slope.	Slight.
Plankinton	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.
GrA*:				
Glenham	Slight	Slight	Slight	Slight.
Prosper	Severe: flooding.	Slight	Moderate: flooding.	Slight.
GrB*:				
Glenham	Slight	Slight	Moderate: slope.	Slight.
Prosper	Severe: flooding.	Slight	Moderate: flooding.	Slight.
HbA Highmore	Slight	Slight	Slight	Slight.
HbB Highmore	Slight	Slight	Moderate: slope.	Slight.
HbC Highmore	Slight	Slight	Severe: slope.	Slight.
HdA*:				
Highmore	Slight	Slight	Slight	Slight.
DeGrey	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
HfA*:				
Highmore	Slight	Slight	Slight	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
HfA*:				
Mobridge	Severe: flooding.	Slight	Moderate: flooding.	Slight.
HgB*:				
Highmore	Slight	Slight	Moderate: slope.	Slight.
Peno	Slight	Slight	Moderate: large stones, slope.	Slight.
HgC*:				
Highmore	Slight	Slight	Severe: slope.	Slight.
Peno	Slight	Slight	Severe: slope.	Slight.
Ho Hoven	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.
Hu Hurley	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
Hz*:				
Hurley	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
Slickspots.				
JbC*:				
Java	Slight	Slight	Severe: slope.	Slight.
Betts	Slight	Slight	Severe: slope.	Slight.
JgB*:				
Java	Slight	Slight	Moderate: slope.	Slight.
Glenham	Slight	Slight	Moderate: slope.	Slight.
JmE*:				
Java	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Schamber	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.
Jr Jerauld	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Severe: erodes easily.
LoA Lowry	Slight	Slight	Slight	Slight.
LoB Lowry	Slight	Slight	Moderate: slope.	Slight.
LoC Lowry	Slight	Slight	Severe: slope.	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
LpC*:				
Lowry	Slight	Slight	Severe: slope.	Slight.
Peno	Slight	Slight	Severe: slope.	Slight.
LpD*:				
Lowry	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Peno	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Mo Mobridge	Severe: flooding.	Slight	Moderate: flooding.	Slight.
OaA Oahe	Slight	Slight	Moderate: small stones.	Slight.
OaB Oahe	Slight	Slight	Moderate: slope, small stones.	Slight.
OdB*:				
Oahe	Slight	Slight	Moderate: slope, small stones.	Slight.
Delmont	Slight	Slight	Moderate: slope.	Slight.
OkF Okaton	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.
OpB Opal	Moderate: percs slowly, too clayey.	Moderate: too clayey, percs slowly.	Moderate: slope, too clayey, depth to rock.	Moderate: too clayey.
OpC Opal	Moderate: percs slowly, too clayey.	Moderate: too clayey, percs slowly.	Severe: slope.	Moderate: too clayey.
OsD*:				
Opal	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.
Sansarc	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
Pa*. Pits				
Pk Plankinton	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.
PrA Promise	Moderate: percs slowly.	Moderate: too clayey, percs slowly.	Moderate: too clayey, percs slowly.	Moderate: too clayey.
PrB Promise	Moderate: percs slowly.	Moderate: too clayey, percs slowly.	Moderate: slope, too clayey, percs slowly.	Moderate: too clayey.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
RaA Raber	Slight	Slight	Slight	Slight.
RaB Raber	Slight	Slight	Moderate: slope.	Slight.
RcA*: Raber	Slight	Slight	Slight	Slight.
Cavo	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
RcB*: Raber	Slight	Slight	Moderate: slope.	Slight.
Cavo	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
RgD*: Raber	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Gettys	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
RhC*: Raber	Slight	Slight	Severe: slope.	Slight.
Peno	Slight	Slight	Severe: slope.	Slight.
Rn Ranslo	Severe: flooding, wetness, excess sodium.	Severe: excess sodium.	Severe: wetness, excess sodium.	Moderate: wetness.
Rr*: Ranslo	Severe: flooding, wetness, excess sodium.	Severe: excess sodium.	Severe: wetness, excess sodium.	Moderate: wetness.
Durrstein	Severe: flooding, wetness, percs slowly.	Severe: wetness, excess sodium, excess salt.	Severe: wetness, percs slowly.	Severe: wetness.
RsA Ree	Slight	Slight	Slight	Slight.
Rt Regan	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.
SaF Sansarc	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.
ScF Schamber	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.
Te Tetonka	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Wa--------------------- Walke	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
Wf--------------------- Wendte	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.
Wo, Wp----------------- Worthing	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements						
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas
AgA, AgB----------- Agar	Good	Good	Good	Good	Very poor	Very poor	Very poor.
AmA*:							
Agar---------------	Good	Good	Good	Good	Very poor	Very poor	Very poor.
Mobridge----------	Good	Good	Fair	Good	Very poor	Very poor	Very poor.
AoA*:							
Agar---------------	Good	Good	Good	Good	Very poor	Very poor	Very poor.
Mobridge----------	Good	Good	Fair	Good	Very poor	Very poor	Very poor.
Tetonka-----------	Poor	Poor	Poor	Poor	Very poor	Fair	Fair.
BgE*:							
Betts--------------	Very poor	Very poor	Fair	Poor	Poor	Very poor	Very poor.
Gettys------------	Very poor	Very poor	Fair	Poor	Very poor	Very poor	Very poor.
BkE*:							
Betts--------------	Very poor	Very poor	Fair	Poor	Very poor	Very poor	Very poor.
Java---------------	Very poor	Fair	Good	Poor	Very poor	Very poor	Very poor.
Bo----------------- Bon	Good	Good	Fair	Good	Very poor	Very poor	Very poor.
Bv----------------- Bon	Fair	Good	Fair	Good	Very poor	Very poor	Very poor.
CaA--------------- Cavo	Poor	Poor	Poor	Poor	Very poor	Very poor	Very poor.
Da----------------- Davison	Good	Good	Fair	Good	Very poor	Very poor	Very poor.
De----------------- DeGrey	Poor	Fair	Fair	Poor	Very poor	Very poor	Very poor.
DmA--------------- Delmont	Poor	Fair	Poor	Poor	Very poor	Very poor	Very poor.
DsD*:							
Delmont-----------	Very poor	Fair	Poor	Poor	Very poor	Very poor	Very poor.
Schamber----------	Very poor	Very poor	Poor	Poor	Very poor	Very poor	Very poor.
Du----------------- Durrstein	Very poor	Poor	Fair	Poor	Very poor	Poor	Fair.
EaA--------------- Eakin	Good	Good	Good	Good	Very poor	Very poor	Very poor.
EpB*:							
Eakin--------------	Good	Good	Good	Good	Very poor	Very poor	Very poor.
Peno---------------	Fair	Good	Good	Fair	Very poor	Very poor	Very poor.
EpC*:							
Eakin--------------	Fair	Good	Good	Fair	Very poor	Very poor	Very poor.
Peno---------------	Poor	Good	Good	Fair	Very poor	Very poor	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas
GeF Gettys	Very poor	Very poor	Fair	Poor	Very poor	Very poor	Very poor.
GlA Glenham	Good	Good	Good	Good	Very poor	Very poor	Very poor.
GpB*:							
Glenham	Good	Good	Good	Good	Very poor	Very poor	Very poor.
Plankinton	Poor	Poor	Poor	Poor	Very poor	Poor	Fair.
GrA*, GrB*:							
Glenham	Good	Good	Good	Good	Very poor	Very poor	Very poor.
Prosper	Good	Good	Fair	Good	Very poor	Very poor	Very poor.
HbA, HbB Highmore	Good	Good	Good	Good	Very poor	Very poor	Very poor.
HbC Highmore	Fair	Good	Good	Fair	Very poor	Very poor	Very poor.
HdA*:							
Highmore	Good	Good	Good	Good	Very poor	Very poor	Very poor.
DeGrey	Poor	Poor	Poor	Poor	Very poor	Very poor	Very poor.
HfA*:							
Highmore	Good	Good	Good	Good	Very poor	Very poor	Very poor.
Mobridge	Good	Good	Fair	Good	Very poor	Very poor	Very poor.
HgB*:							
Highmore	Good	Good	Good	Good	Very poor	Very poor	Very poor.
Peno	Very poor	Very poor	Good	Poor	Very poor	Very poor	Very poor.
HgC*:							
Highmore	Fair	Good	Good	Fair	Very poor	Very poor	Very poor.
Peno	Very poor	Very poor	Good	Poor	Very poor	Very poor	Very poor.
Ho Hoven	Very poor	Poor	Poor	Poor	Very poor	Poor	Fair.
Hu Hurley	Very poor	Very poor	Poor	Poor	Very poor	Very poor	Very poor.
Hz*:							
Hurley	Very poor	Very poor	Poor	Poor	Very poor	Very poor	Very poor.
Slickspots.							
JbC*:							
Java	Poor	Fair	Good	Poor	Very poor	Very poor	Very poor.
Betts	Poor	Fair	Fair	Poor	Very poor	Very poor	Very poor.
JgB*:							
Java	Fair	Fair	Good	Poor	Very poor	Very poor	Very poor.
Glenham	Good	Good	Good	Good	Very poor	Very poor	Very poor.
JmE*:							
Java	Very poor	Fair	Good	Poor	Very poor	Very poor	Very poor.
Schamber	Very poor	Very poor	Poor	Poor	Very poor	Very poor	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas
Jr----------------- Jerauld	Very poor	Very poor	Poor	Poor	Very poor	Very poor	Very poor.
LoA, LoB----------- Lowry	Good	Good	Good	Good	Very poor	Very poor	Very poor.
LoC---------------- Lowry	Fair	Good	Good	Fair	Very poor	Very poor	Very poor.
LpC*:							
Lowry--------------	Fair	Good	Good	Fair	Very poor	Very poor	Very poor.
Peno---------------	Poor	Good	Good	Fair	Very poor	Very poor	Very poor.
LpD*:							
Lowry--------------	Poor	Good	Good	Fair	Very poor	Very poor	Very poor.
Peno---------------	Very poor	Good	Good	Poor	Very poor	Very poor	Very poor.
Mo----------------- Mobridge	Good	Good	Fair	Good	Very poor	Very poor	Very poor.
OaA, OaB----------- Oahe	Fair	Fair	Good	Poor	Very poor	Very poor	Very poor.
OdB*:							
Oahe---------------	Fair	Fair	Good	Poor	Very poor	Very poor	Very poor.
Delmont------------	Poor	Fair	Poor	Poor	Very poor	Very poor	Very poor.
OkF---------------- Okaton	Very poor	Very poor	Fair	Poor	Very poor	Very poor	Very poor.
OpB---------------- Opal	Fair	Fair	Good	Fair	Very poor	Very poor	Very poor.
OpC---------------- Opal	Poor	Fair	Good	Fair	Very poor	Very poor	Very poor.
OsD*:							
Opal---------------	Very poor	Very poor	Good	Poor	Very poor	Very poor	Very poor.
Sansarc------------	Very poor	Very poor	Fair	Poor	Very poor	Very poor	Very poor.
Pa*. Pits							
Pk----------------- Plankinton	Poor	Poor	Poor	Poor	Very poor	Poor	Fair.
PrA, PrB----------- Promise	Fair	Fair	Good	Fair	Very poor	Very poor	Very poor.
RaA, RaB----------- Raber	Good	Good	Good	Fair	Very poor	Very poor	Very poor.
RcA*, RcB*:							
Raber--------------	Good	Good	Good	Fair	Very poor	Very poor	Very poor.
Cavo---------------	Poor	Poor	Poor	Poor	Very poor	Very poor	Very poor.
RgD*:							
Raber--------------	Poor	Good	Good	Fair	Very poor	Very poor	Very poor.
Gettys-------------	Very poor	Fair	Fair	Poor	Very poor	Very poor	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas
RhC*:							
Raber	Fair	Good	Good	Fair	Very poor	Very poor	Very poor.
Peno	Poor	Good	Good	Fair	Very poor	Very poor	Very poor.
Rn Ranslo	Fair	Good	Fair	Good	Very poor	Fair	Fair.
Rr*:							
Ranslo	Fair	Good	Fair	Good	Very poor	Fair	Fair.
Durrstein	Poor	Poor	Fair	Poor	Very poor	Poor	Fair.
RsA Ree	Good	Good	Good	Good	Very poor	Very poor	Very poor.
Rt Regan	Very poor	Poor	Fair	Poor	Poor	Good	Good.
SaF Sansarc	Very poor	Very poor	Fair	Poor	Very poor	Very poor	Very poor.
ScF Schamber	Very poor	Very poor	Poor	Poor	Very poor	Very poor	Very poor.
Te Tetonka	Poor	Poor	Fair	Poor	Very poor	Fair	Fair.
Wa Walke	Fair	Fair	Good	Fair	Very poor	Very poor	Very poor.
Wf Wendte	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor.
Wo Worthing	Very poor	Poor	Fair	Poor	Very poor	Good	Good.
Wp Worthing	Very poor	Very poor	Very poor	Very poor	Very poor	Good	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
AgA Agar	Slight	Slight	Slight	Slight	Severe: low strength.
AgB Agar	Slight	Slight	Slight	Moderate: slope.	Severe: low strength.
AmA*:					
Agar	Slight	Slight	Slight	Slight	Severe: low strength.
Mobridge	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.
AoA*:					
Agar	Slight	Slight	Slight	Slight	Severe: low strength.
Mobridge	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.
Tetonka	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: shrink-swell, ponding.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.
BgE*:					
Betts	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
Gettys	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
BkE*:					
Betts	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
Java	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
Bo Bon	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Bv Bon	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.
CaA Cavo	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.
Da Davison	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: frost action.
De DeGrey	Moderate: too clayey.	Severe: shrink-swell.	Moderate: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
DmA Delmont	Severe: cutbanks cave.	Slight	Slight	Slight	Slight.
DsD*:					
Delmont	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Schamber	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Du Durrstein	Severe: wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, low strength, wetness.
EaA Eakin	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.
EpB*, EpC*:					
Eakin	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: low strength.
Peno	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
GeF Gettys	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
GlA Glenham	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.
GpB*:					
Glenham	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.
Plankinton	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.
GrA*:					
Glenham	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.
Prosper	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding, frost action.
GrB*:					
Glenham	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.
Prosper	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding, frost action.
HbA Highmore	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Severe: low strength.
HbB, HbC Highmore	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
HdA*:					
Highmore	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Severe: low strength.
DeGrey	Moderate: too clayey.	Severe: shrink-swell.	Moderate: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
HfA*:					
Highmore	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Severe: low strength.
Mobridge	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.
HgB*, HgC*:					
Highmore	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.
Peno	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
Ho Hoven	Severe: ponding.	Severe: shrink-swell, ponding.	Severe: shrink-swell, ponding.	Severe: shrink-swell, ponding.	Severe: ponding, low strength, shrink-swell.
Hu Hurley	Moderate: too clayey, depth to rock.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.
Hz*:					
Hurley	Moderate: too clayey, depth to rock.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.
Slickspots.					
JbC*:					
Java	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.
Betts	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.
JgB*:					
Java	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.
Glenham	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.
JmE*:					
Java	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
Schamber	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Jr---------------- Jerauld	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.
LoA--------------- Lowry	Slight-----------	Slight-----------	Slight-----------	Slight------------	Moderate: frost action, low strength.
LoB, LoC---------- Lowry	Slight-----------	Slight-----------	Slight-----------	Moderate: slope.	Moderate: frost action, low strength.
LpC*:					
Lowry------------	Slight-----------	Slight-----------	Slight-----------	Moderate: slope.	Moderate: frost action, low strength.
Peno-------------	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
LpD*:					
Lowry------------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action, low strength.
Peno-------------	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
Mo---------------- Mobridge	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.
OaA--------------- Oahe	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight------------	Slight.
OaB--------------- Oahe	Severe: cutbanks cave.	Slight-----------	Slight-----------	Moderate: slope.	Slight.
OdB*:					
Oahe-------------	Severe: cutbanks cave.	Slight-----------	Slight-----------	Moderate: slope.	Slight.
Delmont----------	Severe: cutbanks cave.	Slight-----------	Slight-----------	Moderate: slope.	Slight.
OkF--------------- Okaton	Severe: slope, depth to rock.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope, depth to rock.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.
OpB, OpC---------- Opal	Moderate: too clayey, depth to rock.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.
OsD*:					
Opal-------------	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell, low strength.
Sansarc----------	Severe: slope, depth to rock.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell, depth to rock.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell, low strength.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Pa*. Pits					
Pk----------------- Plankinton	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.
PrA, PrB----------- Promise	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.
RaA, RaB----------- Raber	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
RcA*:					
Raber--------------	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
Cavo---------------	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.
RcB*:					
Raber--------------	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
Cavo---------------	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.
RgD*:					
Raber--------------	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
Gettys-------------	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
RhC*:					
Raber--------------	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
Peno---------------	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
Rn----------------- Ranslo	Severe: wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, frost action, low strength.
Rr*:					
Ranslo-------------	Severe: wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, frost action, low strength.
Durrstein----------	Severe: wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, low strength, wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
RsA---------------- Ree	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, frost action, shrink-swell.
Rt----------------- Regan	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.
SaF---------------- Sansarc	Severe: slope, depth to rock.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell, depth to rock.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell, low strength.
ScF---------------- Schamber	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Te----------------- Tetonka	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: shrink-swell, ponding.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.
Wa----------------- Walke	Moderate: too clayey.	Severe: shrink-swell.	Moderate: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
Wf----------------- Wendte	Moderate: flooding, too clayey.	Severe: shrink-swell, flooding.	Severe: shrink-swell, flooding.	Severe: shrink-swell, flooding.	Severe: shrink-swell, low strength, flooding.
Wo----------------- Worthing	Severe: ponding.	Severe: shrink-swell, ponding.	Severe: shrink-swell, ponding.	Severe: shrink-swell, ponding.	Severe: low strength, ponding, frost action.
Wp----------------- Worthing	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AgA Agar	Slight	Moderate: seepage.	Slight	Slight	Good.
AgB Agar	Slight	Moderate: slope, seepage.	Slight	Slight	Good.
AmA*:					
Agar	Slight	Moderate: seepage.	Slight	Slight	Good.
Mobridge	Severe: flooding.	Moderate: seepage.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
AoA*:					
Agar	Slight	Moderate: seepage.	Slight	Slight	Good.
Mobridge	Severe: flooding.	Moderate: seepage.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
Tetonka	Severe: percs slowly, ponding.	Slight	Severe: ponding, too clayey.	Severe: ponding.	Poor: ponding, too clayey, hard to pack.
BgE*:					
Betts	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Gettys	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
BkE*:					
Betts	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Java	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Bo Bon	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
Bv Bon	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: wetness.
CaA Cavo	Severe: percs slowly.	Slight	Severe: too clayey, excess sodium.	Slight	Poor: too clayey, hard to pack, excess sodium.
Da Davison	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
De DeGrey	Severe: percs slowly.	Slight	Severe: excess sodium.	Slight	Poor: hard to pack, excess sodium.
DmA Delmont	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: small stones, seepage, too sandy.
DsD*: Delmont	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: small stones, seepage, too sandy.
Schamber	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: small stones, seepage, too sandy.
Du Durrstein	Severe: flooding, percs slowly, wetness.	Slight	Severe: flooding, too clayey, wetness.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
EaA Eakin	Severe: percs slowly.	Slight	Moderate: too clayey.	Slight	Fair: too clayey.
EpB*: Eakin	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Peno	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
EpC*: Eakin	Severe: percs slowly.	Severe: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Peno	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
GeF Gettys	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
GlA Glenham	Severe: percs slowly.	Slight	Moderate: too clayey.	Slight	Fair: too clayey.
GpB*: Glenham	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Plankinton	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
GrA*: Glenham	Severe: percs slowly.	Slight	Moderate: too clayey.	Slight	Fair: too clayey.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
GrA*:					
Prosper	Severe: flooding, wetness, percs slowly.	Slight	Severe: flooding.	Severe: flooding.	Fair: too clayey, wetness.
GrB*:					
Glenham	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Prosper	Severe: flooding, wetness, percs slowly.	Slight	Severe: flooding.	Severe: flooding.	Fair: too clayey, wetness.
HbA Highmore	Slight	Moderate: seepage.	Slight	Slight	Good.
HbB Highmore	Slight	Moderate: slope, seepage.	Slight	Slight	Good.
HbC Highmore	Slight	Severe: slope.	Slight	Slight	Good.
HdA*:					
Highmore	Slight	Moderate: seepage.	Slight	Slight	Good.
DeGrey	Severe: percs slowly.	Slight	Severe: excess sodium.	Slight	Poor: hard to pack, excess sodium.
HfA*:					
Highmore	Slight	Moderate: seepage.	Slight	Slight	Good.
Mobridge	Severe: flooding.	Moderate: seepage.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
HgB*:					
Highmore	Slight	Moderate: slope, seepage.	Slight	Slight	Good.
Peno	Severe: percs slowly.	Moderate: slope, large stones.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
HgC*:					
Highmore	Slight	Severe: slope.	Slight	Slight	Good.
Peno	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Ho Hoven	Severe: percs slowly, ponding.	Slight	Severe: too clayey, ponding, excess sodium.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Hu Hurley	Severe: percs slowly, depth to rock.	Severe: depth to rock.	Severe: depth to rock, excess sodium, too clayey.	Severe: depth to rock.	Poor: area reclaim, hard to pack, excess sodium.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Hz*:					
Hurley	Severe: percs slowly, depth to rock.	Severe: depth to rock.	Severe: depth to rock, excess sodium, too clayey.	Severe: depth to rock.	Poor: area reclaim, hard to pack, excess sodium.
Slickspots.					
JbC*:					
Java	Severe: percs slowly.	Severe: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Betts	Severe: percs slowly.	Severe: slope.	Slight	Slight	Good.
JgB*:					
Java	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Glenham	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
JmE*:					
Java	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Schamber	Severe: slope, poor filter.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: small stones, seepage, too sandy.
Jr Jerauld	Severe: percs slowly.	Slight	Severe: too clayey, excess sodium.	Slight	Poor: too clayey, hard to pack, excess sodium.
LoA Lowry	Slight	Moderate: seepage.	Slight	Slight	Good.
LoB Lowry	Slight	Moderate: slope, seepage.	Slight	Slight	Good.
LoC Lowry	Slight	Severe: slope.	Slight	Slight	Good.
LpC*:					
Lowry	Slight	Severe: slope.	Slight	Slight	Good.
Peno	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
LpD*:					
Lowry	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Peno	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Mo Mobridge	Severe: flooding.	Moderate: seepage.	Severe: flooding.	Severe: flooding.	Fair: too clayey.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
OaA, OaB Oahe	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage, small stones.
OdB*:					
Oahe	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage, small stones.
Delmont	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: small stones, seepage, too sandy.
OkF Okaton	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Poor: hard to pack, area reclaim, slope.
OpB Opal	Severe: percs slowly, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, hard to pack.
OpC Opal	Severe: percs slowly, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, hard to pack.
OsD*:					
Opal	Severe: slope, percs slowly, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Poor: slope, area reclaim, hard to pack.
Sansarc	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Poor: slope, area reclaim, hard to pack.
Pa*. Pits					
Pk Plankinton	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
PrA Promise	Severe: percs slowly.	Slight	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
PrB Promise	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
RaA Raber	Severe: percs slowly.	Slight	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
RaB Raber	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
RcA*:					
Raber	Severe: percs slowly.	Slight	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
RcA*: Cavo	Severe: percs slowly.	Slight	Severe: too clayey, excess sodium.	Slight	Poor: too clayey, hard to pack, excess sodium.
RcB*: Raber	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Cavo	Severe: percs slowly.	Moderate: slope.	Severe: too clayey, excess sodium.	Slight	Poor: too clayey, hard to pack, excess sodium.
RgD*: Raber	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Gettys	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
RhC*: Raber	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Peno	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Rn Ranslo	Severe: percs slowly, flooding, wetness.	Slight	Severe: flooding, wetness, excess sodium.	Severe: flooding, wetness.	Poor: wetness, hard to pack, excess sodium.
Rr*: Ranslo	Severe: percs slowly, flooding, wetness.	Slight	Severe: flooding, wetness, excess sodium.	Severe: flooding, wetness.	Poor: wetness, hard to pack, excess sodium.
Durrstein	Severe: flooding, percs slowly, wetness.	Slight	Severe: flooding, too clayey, wetness.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
RsA Ree	Severe: percs slowly.	Severe: seepage.	Severe: seepage.	Slight	Fair: too clayey, thin layer.
Rt Regan	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
SaF Sansarc	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Poor: slope, area reclaim, hard to pack.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ScF------------------ Schamber	Severe: slope, poor filter.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: small stones, seepage, too sandy.
Te------------------- Tetonka	Severe: percs slowly, ponding.	Slight-----------	Severe: ponding, too clayey.	Severe: ponding.	Poor: ponding, too clayey, hard to pack.
Wa------------------- Walke	Severe: percs slowly.	Slight-----------	Severe: too clayey, excess sodium.	Slight-----------	Poor: too clayey, hard to pack, excess sodium.
Wf------------------- Wendte	Severe: percs slowly, flooding.	Severe: flooding.	Severe: too clayey, flooding.	Severe: flooding.	Poor: too clayey, hard to pack.
Wo------------------- Worthing	Severe: percs slowly, ponding.	Slight-----------	Severe: too clayey, ponding.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Wp------------------- Worthing	Severe: percs slowly, ponding.	Severe: ponding.	Severe: too clayey, ponding.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AgA, AgB Agar	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
AmA*:				
Agar	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Mobridge	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
AoA*:				
Agar	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Mobridge	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Tetonka	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, thin layer.
BgE*:				
Betts	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, slope.
Gettys	Poor: low strength, slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, slope.
BkE*:				
Betts	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Java	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Bo Bon	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Bv Bon	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
CaA Cavo	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
Da Davison	Fair: wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
De DeGrey	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
DmA Delmont	Good	Probable	Probable	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
DsD*: Delmont	Good	Probable	Probable	Poor: small stones, area reclaim.
Schamber	Good	Probable	Probable	Poor: small stones, area reclaim.
Du Durrstein	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, wetness, excess sodium.
EaA Eakin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
EpB*, EpC*: Eakin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Peno	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
GeF Gettys	Poor: low strength, slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
GlA Glenham	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
GpB*: Glenham	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Plankinton	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
GrA*, GrB*: Glenham	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Prosper	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
HbA, HbB, HbC Highmore	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
HdA*: Highmore	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
DeGrey	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
HfA*: Highmore	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Mobridge	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
HgB*, HgC*:				
Highmore	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Peno	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
Ho Hoven	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
Hu Hurley	Poor: shrink-swell, low strength, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
Hz*:				
Hurley	Poor: shrink-swell, low strength, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
Slickspots.				
JbC*:				
Java	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Betts	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
JgB*:				
Java	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Glenham	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
JmE*:				
Java	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Schamber	Fair: slope.	Probable	Probable	Poor: slope, small stones, area reclaim.
Jr Jerauld	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
LoA, LoB, LoC Lowry	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
LpC*:				
Lowry	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Peno	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
LpD*:				
Lowry	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
LpD*:				
Peno	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Mo Mobridge	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
OaA, OaB Oahe	Good	Probable	Probable	Poor: small stones, area reclaim.
OdB*:				
Oahe	Good	Probable	Probable	Poor: small stones, area reclaim.
Delmont	Good	Probable	Probable	Poor: small stones, area reclaim.
OkF Okaton	Poor: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope, area reclaim.
OpB, OpC Opal	Poor: shrink-swell, low strength, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
OsD*:				
Opal	Poor: shrink-swell, low strength, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
Sansarc	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey, area reclaim.
Pa*. Pits				
Pk Plankinton	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
PrA, PrB Promise	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
RaA, RaB Raber	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
RcA*, RcB*:				
Raber	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Cavo	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
RgD*:				
Raber	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Gettys	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
RhC*:				
Raber	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Peno	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Rn Ranslo	Poor. shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
Rr*:				
Ranslo	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
Durrstein	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, wetness, excess sodium.
RsA Ree	Good	Probable	Probable	Fair: small stones, area reclaim.
Rt Regan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
SaF Sansarc	Poor: slope, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey, area reclaim.
ScF Schamber	Poor: slope.	Probable	Probable	Poor: slope, small stones, area reclaim.
Te Tetonka	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, thin layer.
Wa Walke	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
Wf Wendte	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, too clayey.
Wo Worthing	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Wp-------------------- Worthing	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation.]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AgA--------------- Agar	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable-------	Erodes easily	Erodes easily.
AgB--------------- Agar	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope-----------	Erodes easily	Erodes easily.
AmA*:						
Agar-------------	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable-------	Erodes easily	Erodes easily.
Mobridge---------	Moderate: seepage.	Moderate: piping.	Deep to water	Flooding--------	Erodes easily	Erodes easily.
AoA*:						
Agar-------------	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable-------	Erodes easily	Erodes easily.
Mobridge---------	Moderate: seepage.	Moderate: piping.	Deep to water	Flooding--------	Erodes easily	Erodes easily.
Tetonka----------	Slight----------	Severe: ponding, hard to pack.	Percs slowly, ponding, frost action.	Percs slowly, ponding.	Ponding, percs slowly.	Wetness, percs slowly.
BgE*:						
Betts------------	Severe: slope.	Moderate: large stones.	Deep to water	Slope-----------	Slope, large stones, erodes easily.	Large stones, slope, erodes easily.
Gettys-----------	Severe: slope.	Severe: hard to pack.	Deep to water	Slope-----------	Slope, large stones.	Large stones, slope.
BkE*:						
Betts------------	Severe: slope.	Slight----------	Deep to water	Slope-----------	Slope, erodes easily.	Slope, erodes easily.
Java-------------	Severe: slope.	Slight----------	Deep to water	Slope, excess salt.	Slope, erodes easily.	Slope, erodes easily.
Bo---------------- Bon	Moderate: seepage.	Severe: piping.	Deep to water	Flooding--------	Favorable------	Favorable.
Bv---------------- Bon	Moderate: seepage.	Moderate: piping.	Flooding, frost action.	Wetness, flooding.	Wetness---------	Favorable.
CaA--------------- Cavo	Slight----------	Severe: excess sodium.	Deep to water	Droughty, percs slowly.	Percs slowly---	Excess sodium, droughty, percs slowly.
Da---------------- Davison	Moderate: seepage.	Severe: piping.	Frost action---	Wetness---------	Erodes easily, wetness.	Erodes easily.
De---------------- DeGrey	Slight----------	Severe: hard to pack, excess sodium.	Deep to water	Percs slowly, excess sodium.	Erodes easily	Excess sodium, erodes easily, percs slowly.
DmA--------------- Delmont	Severe: seepage.	Severe: seepage.	Deep to water	Droughty--------	Too sandy------	Droughty.
DsD*:						
Delmont----------	Severe: seepage, slope.	Severe: seepage.	Deep to water	Droughty, slope.	Slope, too sandy.	Droughty, slope.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
DsD*:						
Schamber	Severe: slope, seepage.	Severe: seepage.	Deep to water	Droughty, slope.	Slope, too sandy.	Slope, droughty.
Du Durrstein	Slight	Severe: hard to pack, wetness, excess sodium.	Flooding, percs slowly, excess salt.	Wetness, excess sodium, percs slowly.	Wetness, percs slowly, erodes easily.	Excess sodium, excess salt, wetness.
EaA Eakin	Moderate: seepage.	Moderate: hard to pack.	Deep to water	Favorable	Erodes easily	Erodes easily.
EpB*, EpC*:						
Eakin	Moderate: seepage, slope.	Moderate: hard to pack.	Deep to water	Slope	Erodes easily	Erodes easily.
Peno	Moderate: slope.	Severe: hard to pack.	Deep to water	Slope	Favorable	Favorable.
GeF Gettys	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
GlA Glenham	Slight	Slight	Deep to water	Favorable	Erodes easily	Erodes easily.
GpB*:						
Glenham	Slight	Slight	Deep to water	Favorable	Erodes easily	Erodes easily.
Plankinton	Slight	Severe: ponding.	Ponding, percs slowly.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
GrA*:						
Glenham	Slight	Slight	Deep to water	Favorable	Erodes easily	Erodes easily.
Prosper	Slight	Slight	Deep to water	Flooding	Erodes easily	Erodes easily.
GrB*:						
Glenham	Moderate: slope.	Slight	Deep to water	Slope	Erodes easily	Erodes easily.
Prosper	Slight	Slight	Deep to water	Flooding	Erodes easily	Erodes easily.
HbA Highmore	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable	Erodes easily	Erodes easily.
HbB, HbC Highmore	Moderate: slope, seepage.	Moderate: piping.	Deep to water	Slope	Erodes easily	Erodes easily.
HdA*:						
Highmore	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable	Erodes easily	Erodes easily.
DeGrey	Slight	Severe: hard to pack, excess sodium.	Deep to water	Percs slowly, excess sodium.	Erodes easily	Excess sodium, erodes easily, percs slowly.
HfA*:						
Highmore	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable	Erodes easily	Erodes easily.
Mobridge	Moderate: seepage.	Moderate: piping.	Deep to water	Flooding	Erodes easily	Erodes easily.
HgB*, HgC*:						
Highmore	Moderate: slope, seepage.	Moderate: piping.	Deep to water	Slope	Erodes easily	Erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
HgB*, HgC*:						
Peno--------------	Moderate: slope.	Severe: hard to pack.	Deep to water	Slope, excess salt.	Large stones---	Large stones.
Ho----------------- Hoven	Slight----------	Severe: hard to pack, ponding, excess sodium.	Percs slowly, ponding, excess salt.	Ponding, percs slowly, excess sodium.	Wetness, percs slowly.	Percs slowly, wetness, excess sodium.
Hu----------------- Hurley	Moderate: depth to rock, slope.	Severe: hard to pack, excess sodium.	Deep to water	Percs slowly, excess sodium, depth to rock.	Depth to rock, erodes easily.	Excess sodium, erodes easily.
Hz*:						
Hurley------------	Moderate: depth to rock.	Severe: hard to pack, excess sodium.	Deep to water	Percs slowly, excess sodium, depth to rock.	Depth to rock, erodes easily.	Excess sodium, erodes easily.
Slickspots.						
JbC*:						
Java--------------	Moderate: seepage, slope.	Slight----------	Deep to water	Slope, excess salt.	Erodes easily	Erodes easily.
Betts-------------	Moderate: seepage, slope.	Slight----------	Deep to water	Slope-----------	Erodes easily	Erodes easily.
JgB*:						
Java--------------	Moderate: seepage, slope.	Slight----------	Deep to water	Slope, excess salt.	Erodes easily	Erodes easily.
Glenham-----------	Moderate: slope.	Slight----------	Deep to water	Slope-----------	Erodes easily	Erodes easily.
JmE*:						
Java--------------	Severe: slope.	Slight----------	Deep to water	Slope, excess salt.	Slope, erodes easily.	Slope, erodes easily.
Schamber----------	Severe: slope, seepage.	Severe: seepage.	Deep to water	Droughty, slope.	Slope, too sandy.	Slope, droughty.
Jr----------------- Jerauld	Slight----------	Severe: hard to pack, excess sodium.	Deep to water	Percs slowly, excess sodium.	Percs slowly, erodes easily.	Excess sodium, droughty, erodes easily.
LoA---------------- Lowry	Moderate: seepage.	Severe: piping.	Deep to water	Favorable------	Erodes easily	Erodes easily.
LoB, LoC----------- Lowry	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope-----------	Erodes easily	Erodes easily.
LpC*:						
Lowry-------------	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope-----------	Erodes easily	Erodes easily.
Peno--------------	Moderate: slope.	Severe: hard to pack.	Deep to water	Slope-----------	Favorable------	Favorable.
LpD*:						
Lowry-------------	Severe: slope.	Severe: piping.	Deep to water	Slope-----------	Slope, erodes easily.	Slope, erodes easily.
Peno--------------	Severe: slope.	Severe: hard to pack.	Deep to water	Slope-----------	Slope-----------	Slope.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Mo Mobridge	Moderate: seepage.	Moderate: piping.	Deep to water	Flooding	Erodes easily	Erodes easily.
OaA Oahe	Severe: seepage.	Severe: seepage.	Deep to water	Favorable	Too sandy	Favorable.
OaB Oahe	Severe: seepage.	Severe: seepage.	Deep to water	Slope	Too sandy	Favorable.
OdB*:						
Oahe	Severe: seepage.	Severe: seepage.	Deep to water	Slope	Too sandy	Favorable.
Delmont	Severe: seepage.	Severe: seepage.	Deep to water	Droughty, slope.	Too sandy	Droughty.
OkF Okaton	Severe: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
OpB, OpC Opal	Moderate: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slow intake, percs slowly, slope.	Depth to rock, erodes easily.	Erodes easily.
OsD*:						
Opal	Severe: slope.	Severe: hard to pack.	Deep to water	Slow intake, percs slowly, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily.
Sansarc	Severe: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slow intake, droughty, percs slowly.	Slope, depth to rock, percs slowly.	Slope, droughty, erodes easily.
Pa*. Pits						
Pk Plankinton	Slight	Severe: ponding.	Ponding, percs slowly.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
PrA Promise	Slight	Severe: hard to pack.	Deep to water	Slow intake, percs slowly, droughty.	Percs slowly, erodes easily.	Erodes easily, droughty.
PrB Promise	Moderate: slope.	Severe: hard to pack.	Deep to water	Slow intake, percs slowly, droughty.	Percs slowly, erodes easily.	Erodes easily, droughty.
RaA Raber	Slight	Moderate: piping, hard to pack.	Deep to water	Percs slowly	Erodes easily, percs slowly.	Erodes easily, percs slowly.
RaB Raber	Moderate: slope.	Moderate: piping, hard to pack.	Deep to water	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
RcA*:						
Raber	Slight	Moderate: piping, hard to pack.	Deep to water	Percs slowly	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Cavo	Slight	Severe: excess sodium.	Deep to water	Droughty, percs slowly.	Percs slowly	Excess sodium, droughty, percs slowly.
RcB*:						
Raber	Moderate: slope.	Moderate: piping, hard to pack.	Deep to water	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
RcB*:						
Cavo	Moderate: slope.	Severe: excess sodium.	Deep to water	Droughty, percs slowly, slope.	Percs slowly	Excess sodium, droughty, percs slowly.
RgD*:						
Raber	Severe: slope.	Moderate: piping, hard to pack.	Deep to water	Percs slowly, slope.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Gettys	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
RhC*:						
Raber	Moderate: slope.	Moderate: piping, hard to pack.	Deep to water	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Peno	Moderate: slope.	Severe: hard to pack.	Deep to water	Slope	Favorable	Favorable.
Rn Ranslo	Slight	Severe: wetness, excess sodium.	Percs slowly, flooding, frost action.	Percs slowly, wetness, excess sodium.	Wetness, percs slowly.	Excess sodium, wetness.
Rr*:						
Ranslo	Slight	Severe: wetness, excess sodium.	Percs slowly, flooding, frost action.	Percs slowly, wetness, excess sodium.	Wetness, percs slowly.	Excess sodium, wetness.
Durrstein	Slight	Severe: hard to pack, wetness, excess sodium.	Flooding, percs slowly, excess salt.	Wetness, excess sodium, percs slowly.	Wetness, percs slowly, erodes easily.	Excess sodium, excess salt, wetness.
RsA Ree	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Favorable	Favorable	Favorable.
Rt Regan	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, flooding, excess salt.	Wetness	Wetness.
SaF Sansarc	Severe: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slow intake, droughty, percs slowly.	Slope, depth to rock, percs slowly.	Slope, droughty, erodes easily.
ScF Schamber	Severe: slope, seepage.	Severe: seepage.	Deep to water	Droughty, slope.	Slope, too sandy.	Slope, droughty.
Te Tetonka	Slight	Severe: ponding, hard to pack.	Percs slowly, ponding, frost action.	Percs slowly, ponding.	Ponding, percs slowly.	Wetness, percs slowly.
Wa Walke	Slight	Severe: hard to pack, excess sodium.	Deep to water	Percs slowly, excess sodium.	Percs slowly	Excess sodium, percs slowly.
Wf Wendte	Slight	Severe: hard to pack.	Deep to water	Flooding, percs slowly.	Percs slowly	Percs slowly.
Wo Worthing	Slight	Severe: hard to pack, ponding.	Ponding, frost action, percs slowly.	Ponding, percs slowly.	Ponding, percs slowly, erodes easily.	Wetness, percs slowly.
Wp Worthing	Slight	Severe: hard to pack, ponding.	Percs slowly, ponding, frost action.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AgA, AgB--------- Agar	0-5	Silt loam--------	ML, CL	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	5-20
	5-20	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	100	100	95-100	90-100	35-50	10-25
	20-60	Silt loam, silty clay loam, clay loam.	ML, CL	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	5-22
AmA*: Agar------------	0-5	Silt loam--------	ML, CL	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	5-20
	5-20	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	100	100	95-100	90-100	35-50	10-25
	20-60	Silt loam, silty clay loam, clay loam.	ML, CL	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	5-22
Mobridge--------	0-10	Silt loam--------	ML, CL	A-6, A-7, A-4	0	100	100	90-100	70-100	30-45	5-20
	10-28	Silty clay loam, clay loam.	CL, ML, CH, MH	A-6, A-7	0	100	100	95-100	85-100	35-55	10-30
	28-60	Silty clay loam, clay loam, silt loam.	CL, CH	A-6, A-7	0-5	95-100	95-100	95-100	85-100	35-55	15-35
AoA*: Agar------------	0-5	Silt loam--------	ML, CL	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	5-20
	5-20	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	100	100	95-100	90-100	35-50	10-25
	20-60	Silt loam, silty clay loam, clay loam.	ML, CL	A-4, A-6, A-7	0	100	100	95-100	90-100	30-50	5-22
Mobridge--------	0-10	Silt loam--------	ML, CL	A-6, A-7, A-4	0	100	100	90-100	70-100	30-45	5-20
	10-28	Silty clay loam, clay loam.	CL, ML, CH, MH	A-6, A-7	0	100	100	95-100	85-100	35-55	10-30
	28-60	Silty clay loam, clay loam, silt loam.	CL, CH	A-6, A-7	0-5	95-100	95-100	95-100	85-100	35-55	15-35
Tetonka---------	0-14	Silt loam--------	ML, CL	A-4, A-6, A-7	0	100	100	95-100	80-100	27-50	5-20
	14-47	Clay, silty clay, silty clay loam.	CL, CH, MH, ML	A-7	0	95-100	95-100	85-100	65-100	40-70	15-35
	47-60	Clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	95-100	95-100	80-100	55-95	30-60	11-30
BgE*: Betts-----------	0-4	Stony loam-------	CL, CL-ML	A-4, A-6	10-25	100	90-100	85-100	60-75	25-40	5-15
	4-23	Loam, clay loam, stony clay loam.	CL	A-6, A-7	5-20	100	90-100	85-100	50-85	30-45	10-20
	23-60	Loam, clay loam, stony clay loam.	CL	A-6, A-7	5-20	100	90-100	85-100	50-85	30-45	10-20
Gettys----------	0-3	Stony clay loam	CL, CH	A-7	10-25	95-100	90-100	85-100	70-85	40-60	15-30
	3-60	Clay loam, clay	CL, CH, MH	A-7	5-20	95-100	90-100	85-100	60-80	40-60	20-30
BkE*: Betts-----------	0-4	Loam-------------	CL, CL-ML	A-4, A-6	0-5	90-100	80-100	75-100	60-75	20-38	5-15
	4-23	Loam, clay loam	CL	A-6, A-7	0-5	90-100	85-100	75-100	50-85	30-45	10-25
	23-60	Clay loam, loam	CL	A-6, A-7	0-5	90-100	85-100	75-100	50-85	30-45	10-25
Java------------	0-4	Loam-------------	ML, CL	A-4, A-6, A-7	0	95-100	95-100	80-95	60-85	30-45	5-20
	4-9	Loam, clay loam	CL, ML	A-6, A-7	0-5	95-100	90-100	80-95	60-85	30-45	10-20
	9-34	Loam, clay loam	CL, ML	A-6, A-7	0-5	95-100	85-100	80-95	60-85	30-45	10-20
	34-60	Loam, clay loam	CL	A-6, A-7	0-5	95-100	85-100	75-95	60-85	30-45	10-25

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Bo---------------- Bon	0-8	Loam-------------	CL-ML, CL	A-4, A-6	0	100	95-100	80-95	55-85	25-40	5-15
	8-23	Stratified silty clay loam to fine sandy loam.	CL, ML, CL-ML	A-4, A-6	0	100	95-100	80-95	60-85	25-40	3-15
	23-60	Stratified silty clay loam to fine sandy loam.	ML, SM, SC, CL	A-4, A-6, A-7	0	95-100	95-100	75-95	45-95	25-45	3-22
Bv---------------- Bon	0-8	Loam-------------	CL-ML, CL	A-4, A-6	0	100	90-100	80-95	60-85	25-40	5-15
	8-23	Stratified silty clay loam to fine sandy loam.	CL, CL-ML, ML	A-4, A-6	0	100	95-100	80-95	60-85	25-40	3-15
	23-60	Stratified silty clay loam to fine sandy loam.	ML, SM, CL, CL-ML	A-4, A-6, A-7	0	95-100	95-100	75-95	45-95	25-45	3-22
CaA-------------- Cavo	0-8	Loam-------------	CL, CL-ML	A-4, A-6	0	100	95-100	85-100	60-85	25-40	5-20
	8-14	Clay loam, clay	CL, CH	A-7	0	100	95-100	90-100	70-95	40-65	15-35
	14-60	Clay loam, clay	CL, CH	A-7, A-6	0-5	95-100	95-100	85-100	60-95	36-55	15-30
Da--------------- Davison	0-12	Loam-------------	CL-ML, CL	A-4, A-6	0	95-100	95-100	85-95	50-85	25-40	5-20
	12-30	Loam, clay loam, sandy loam.	CL, CL-ML, SC, SM-SC	A-4, A-6	0	95-100	95-100	85-100	45-80	25-40	5-20
	30-60	Loam, clay loam	CL-ML, CL	A-4, A-6	0-5	95-100	95-100	85-100	60-80	25-40	5-20
De--------------- DeGrey	0-9	Silt loam--------	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-100	25-40	5-15
	9-20	Silty clay, silty clay loam.	CL, CH	A-7	0	100	100	90-100	80-100	40-65	15-35
	20-39	Silty clay, silty clay loam.	CL, CH	A-7	0	100	95-100	90-100	80-100	40-65	15-35
	39-60	Loam, clay loam	CL, CH, MH, ML	A-6, A-7	0	100	95-100	90-100	80-100	30-65	12-32
DmA-------------- Delmont	0-4	Loam-------------	CL	A-6, A-4	0	90-100	90-100	80-95	60-75	28-40	8-20
	4-16	Loam, fine sandy loam, sandy loam.	SC, CL, CL-ML, SM-SC	A-4, A-6	0	80-100	70-100	50-100	35-70	20-40	5-18
	16-60	Gravelly sand, gravelly loamy sand.	SM, SW-SM, SM-SC, SW	A-1, A-2	0-5	60-100	40-80	15-50	3-30	<25	NP-5
DsD*:											
Delmont---------	0-4	Loam-------------	CL	A-6, A-4	0	90-100	90-100	80-95	60-75	28-40	8-20
	4-16	Loam, fine sandy loam, sandy loam.	SC, CL, CL-ML, SM-SC	A-4, A-6	0	80-100	70-100	50-100	35-70	20-40	5-18
	16-60	Gravelly sand, gravelly loamy sand.	SM, SW-SM, SM-SC, SW	A-1, A-2	0-5	60-100	40-80	15-50	3-30	<25	NP-5
Schamber--------	0-4	Gravelly loam----	SM, SW-SM, GM, GW-GM	A-2, A-1	0-5	55-90	40-75	30-60	10-35	<25	NP-5
	4-60	Gravelly sand, very gravelly sand, gravelly loamy sand.	SW, SW-SM, GW, GW-GM	A-1	0-15	30-60	15-40	5-20	0-10	<25	NP-5
Du--------------- Durrstein	0-2	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	100	85-100	60-90	20-35	3-15
	2-15	Silty clay, clay, clay loam.	CH, MH	A-7	0	95-100	95-100	85-100	65-95	50-85	20-50
	15-60	Silty clay, clay, clay loam.	CH, CL	A-7	0	95-100	95-100	85-100	60-95	40-75	15-50
EaA-------------- Eakin	0-7	Silt loam--------	ML, CL	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	5-20
	7-30	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	100	95-100	95-100	80-100	35-50	10-25
	30-60	Clay loam, loam, clay.	CL, CH	A-7	0	95-100	85-100	75-100	60-95	40-70	16-42

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
EpB*, EpC*:											
Eakin-----------	0-7	Silt loam--------	ML, CL	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	5-20
	7-30	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	100	95-100	95-100	80-100	35-50	10-25
	30-60	Clay loam, loam, clay.	CL, CH	A-7	0	95-100	85-100	75-100	60-95	40-70	16-42
Peno------------	0-4	Loam------------	ML, CL	A-6, A-7, A-4	0-5	95-100	95-100	85-95	60-75	30-45	5-20
	4-9	Clay loam, clay	CL, CH	A-7	0-5	95-100	95-100	85-95	70-85	40-65	15-35
	9-60	Clay loam, clay	CL, CH, ML	A-7	0-5	95-100	95-100	85-95	70-85	45-80	20-45
GeF-------------- Gettys	0-3	Clay loam--------	CL, CH	A-7	0	95-100	90-100	85-100	70-85	40-60	15-30
	3-60	Clay loam, clay	CL, CH, MH	A-7	0	95-100	90-100	85-100	60-80	40-60	20-35
GlA-------------- Glenham	0-4	Loam------------	CL, ML	A-6, A-7, A-4	0	95-100	95-100	85-100	60-85	30-50	8-20
	4-14	Clay loam, loam	CL	A-6, A-7	0	95-100	95-100	85-100	50-85	30-50	10-25
	14-60	Clay loam, loam	CL	A-6, A-7	0-5	90-100	90-100	80-95	50-85	30-50	10-30
GpB*:											
Glenham---------	0-4	Loam------------	CL, ML	A-6, A-7, A-4	0	95-100	95-100	85-100	60-85	30-50	8-20
	4-14	Clay loam, loam	CL	A-6, A-7	0	95-100	95-100	85-100	50-85	30-50	10-25
	14-60	Clay loam, loam	CL	A-6, A-7	0-5	90-100	90-100	80-95	50-85	30-50	10-30
Plankinton------	0-7	Silt loam--------	ML, CL	A-4, A-6	0	100	100	90-100	80-100	27-40	5-15
	7-28	Clay, silty clay, clay loam.	CH, MH, CL, ML	A-7	0	100	95-100	90-100	70-100	40-70	15-35
	28-60	Clay, silty clay, clay loam.	CH, CL	A-6, A-7	0	95-100	90-100	85-100	65-100	30-60	15-30
GrA*, GrB*:											
Glenham---------	0-4	Loam------------	CL, ML	A-6, A-7, A-4	0	95-100	95-100	85-100	60-85	30-50	8-20
	4-14	Clay loam, loam	CL	A-6, A-7	0	95-100	95-100	85-100	50-85	30-50	10-25
	14-60	Clay loam, loam	CL	A-6, A-7	0-5	90-100	90-100	80-95	50-85	30-50	10-30
Prosper---------	0-13	Loam------------	CL	A-4, A-6	0	95-100	95-100	85-100	60-90	25-40	8-20
	13-29	Clay loam, silty clay loam.	CL, ML	A-6, A-7	0	95-100	95-100	85-100	60-90	35-50	10-25
	29-36	Clay loam, loam	CL	A-6, A-7	0-5	95-100	95-100	80-95	55-85	30-50	10-25
	36-60	Clay loam, loam	CL	A-6, A-7	0-5	95-100	95-100	80-95	55-85	30-50	10-25
HbA, HbB, HbC---- Highmore	0-5	Silt loam--------	ML, CL	A-4, A-6, A-7	0	100	95-100	95-100	90-100	30-45	5-20
	5-22	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	85-100	35-50	10-25
	22-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	85-100	35-50	10-25
HdA*:											
Highmore--------	0-5	Silt loam--------	ML, CL	A-4, A-6, A-7	0	100	95-100	95-100	90-100	30-45	5-20
	5-22	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	85-100	35-50	10-25
	22-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	85-100	35-50	10-25
DeGrey----------	0-9	Silt loam--------	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-100	25-40	5-15
	9-20	Silty clay, silty clay loam.	CL, CH	A-7	0	100	100	90-100	80-100	40-65	15-35
	20-39	Silty clay, silty clay loam.	CL, CH	A-7	0	100	95-100	90-100	80-100	40-65	15-35
	39-60	Loam, clay loam	CL, CH, MH, ML	A-6, A-7	0	100	95-100	90-100	80-100	30-65	12-32

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
HfA*:											
Highmore	0-5	Silt loam	ML, CL	A-4, A-6, A-7	0	100	95-100	95-100	90-100	30-45	5-20
	5-22	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	85-100	35-50	10-25
	22-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	85-100	35-50	10-25
Mobridge	0-10	Silt loam	ML, CL	A-6, A-7, A-4	0	100	100	90-100	70-100	30-45	5-20
	10-28	Silty clay loam, clay loam.	CL, ML, CH, MH	A-6, A-7	0	100	100	95-100	85-100	35-55	10-30
	28-60	Silty clay loam, clay loam, silt loam.	CL, CH	A-6, A-7	0-5	95-100	95-100	95-100	85-100	35-55	15-35
HgB*, HgC*:											
Highmore	0-5	Silt loam	ML, CL	A-4, A-6, A-7	0	100	95-100	95-100	90-100	30-45	5-20
	5-22	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	85-100	35-50	10-25
	22-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	85-100	35-50	10-25
Peno	0-4	Stony loam	ML, CL	A-6, A-7, A-4	10-25	95-100	95-100	85-95	60-75	30-45	5-20
	4-9	Clay loam, clay	CL, CH	A-7	5-20	95-100	95-100	85-95	70-85	40-65	15-35
	9-60	Clay loam, clay	CL, CH	A-7	5-20	95-100	95-100	85-95	70-85	45-80	20-45
Ho Hoven	0-4	Silt loam	ML, CL, CL-ML	A-4, A-6, A-7	0	100	100	90-100	75-95	27-45	5-20
	4-10	Silty clay, clay, clay loam.	CH, MH, CL	A-7	0	100	95-100	95-100	80-100	45-80	20-40
	10-30	Silty clay, clay, clay loam.	CH, MH, CL	A-7	0	100	95-100	95-100	80-100	45-80	20-40
	30-60	Silty clay, clay, clay loam.	CL, CH	A-6, A-7	0	95-100	90-100	80-100	60-100	35-75	11-45
Hu Hurley	0-3	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	3-25	Clay, shaly clay	CH, MH	A-7	0	100	100	95-100	80-100	50-90	20-55
	25-60	Weathered bedrock	CH, MH	A-7	0	100	100	95-100	80-100	50-100	20-65
Hz*:											
Hurley	0-4	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	4-25	Clay, shaly clay	CH, MH	A-7	0	100	100	95-100	80-100	50-90	20-55
	25-60	Weathered bedrock	CH, MH	A-7	0	100	100	95-100	80-100	50-100	20-65
Slickspots.											
JbC*:											
Java	0-4	Loam	ML, CL	A-4, A-6, A-7	0	95-100	95-100	80-95	60-85	30-45	5-20
	4-9	Loam, clay loam	CL, ML	A-6, A-7	0-5	95-100	90-100	80-95	60-85	30-45	10-20
	9-34	Loam, clay loam	CL, ML	A-6, A-7	0-5	95-100	85-100	80-95	60-85	30-45	10-20
	34-60	Loam, clay loam	CL	A-6, A-7	0-5	95-100	85-100	75-95	60-85	30-45	10-25
Betts	0-4	Loam	CL, CL-ML	A-4, A-6	0-5	90-100	80-100	75-100	60-75	20-38	5-15
	4-23	Loam, clay loam	CL	A-6, A-7	0-5	90-100	85-100	75-100	50-85	30-45	10-25
	23-60	Clay loam, loam	CL	A-6, A-7	0-5	90-100	85-100	75-100	50-85	30-45	10-25
JgB*:											
Java	0-4	Loam	ML, CL	A-4, A-6, A-7	0	95-100	95-100	80-95	60-85	30-45	5-20
	4-9	Loam, clay loam	CL, ML	A-6, A-7	0-5	95-100	90-100	80-95	60-85	30-45	10-20
	9-34	Loam, clay loam	CL, ML	A-6, A-7	0-5	95-100	85-100	80-95	60-85	30-45	10-20
	34-60	Loam, clay loam	CL	A-6, A-7	0-5	95-100	85-100	75-95	60-85	30-45	10-25
Glenham	0-4	Loam	CL, ML	A-6, A-7, A-4	0	95-100	95-100	85-100	60-85	30-50	8-20
	4-14	Clay loam, loam	CL	A-6, A-7	0	95-100	95-100	85-100	50-85	30-50	10-25
	14-60	Clay loam, loam	CL	A-6, A-7	0-5	90-100	90-100	80-95	50-85	30-50	10-30

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
JmE*:											
Java	0-4	Loam	ML, CL	A-4, A-6, A-7	0	95-100	95-100	80-95	60-85	30-45	5-20
	4-9	Loam, clay loam	CL, ML	A-6, A-7	0-5	95-100	90-100	80-95	60-85	30-45	10-20
	9-34	Loam, clay loam	CL, ML	A-6, A-7	0-5	95-100	85-100	80-95	60-85	30-45	10-20
	34-60	Loam, clay loam	CL	A-6, A-7	0-5	95-100	85-100	75-95	60-85	30-45	10-25
Schamber	0-4	Gravelly loam	SM, SW-SM, GM, GW-GM	A-2, A-1	0-5	55-90	40-75	30-60	10-35	<25	NP-5
	4-60	Gravelly sand, very gravelly sand, gravelly loamy sand.	SW, SW-SM, GW, GW-GM	A-1	0-15	30-60	15-40	5-20	0-10	<25	NP-5
Jr Jerauld	0-3	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	60-100	25-40	5-15
	3-8	Silty clay, clay, clay loam.	CH, CL	A-7	0	95-100	95-100	90-100	55-95	45-70	20-40
	8-13	Silty clay, clay, clay loam.	CH, CL	A-7	0	95-100	95-100	90-100	55-95	45-70	20-40
	13-60	Silty clay, clay, clay loam.	CL, CH, MH, ML	A-7	0	95-100	95-100	85-100	55-90	40-85	20-45
LoA, LoB, LoC Lowry	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	100	100	95-100	80-100	25-40	5-15
	5-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	100	100	95-100	80-100	25-40	5-15
	11-60	Silt loam, loam, very fine sandy loam.	ML, CL, CL-ML	A-4, A-6	0	100	100	95-100	70-100	25-40	3-15
LpC*, LpD*:											
Lowry	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	100	100	95-100	80-100	25-40	5-15
	5-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	100	100	95-100	80-100	25-40	5-15
	11-60	Silt loam, loam, very fine sandy loam.	ML, CL, CL-ML	A-4, A-6	0	100	100	95-100	70-100	25-40	3-15
Peno	0-4	Loam	ML, CL	A-6, A-7, A-4	0-5	95-100	95-100	85-95	60-75	30-45	5-20
	4-9	Clay loam, clay	CL, CH	A-7	0-5	95-100	95-100	85-95	70-85	40-65	15-35
	9-60	Clay loam, clay	CL, CH, ML	A-7	0-5	95-100	95-100	85-95	70-85	45-80	20-45
Mo Mobridge	0-10	Silt loam	ML, CL	A-6, A-7, A-4	0	100	100	90-100	70-100	30-45	5-20
	10-28	Silty clay loam, clay loam.	CL, ML, CH, MH	A-6, A-7	0	100	100	95-100	85-100	35-55	10-30
	28-60	Silty clay loam, clay loam, silt loam.	CL, CH	A-6, A-7	0-5	95-100	95-100	95-100	85-100	35-55	15-35
OaA, OaB Oahe	0-5	Loam	ML, CL	A-4, A-6, A-7	0	90-100	85-100	60-95	50-80	30-45	5-20
	5-14	Loam, clay loam	CL, ML	A-4, A-6, A-7	0	80-100	80-100	60-95	50-75	30-45	5-20
	14-22	Loam, sandy loam	CL, CL-ML, SM-SC, SC	A-2, A-4, A-6, A-7	0	80-95	70-95	50-95	30-75	20-45	5-20
	22-60	Very gravelly loam, gravelly loamy sand, gravelly sand.	SW, SM, GW, SW-SC	A-1, A-2, A-3	0	30-85	30-75	10-60	0-30	<25	NP-7

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
OdB*:											
Oahe------------	0-5	Loam-------------	ML, CL	A-4, A-6, A-7	0	90-100	85-100	60-95	50-80	30-45	5-20
	5-14	Loam, clay loam	CL, ML	A-4, A-6, A-7	0	80-100	80-100	60-95	50-75	30-45	5-20
	14-22	Loam, sandy loam	CL, CL-ML, SM-SC, SC	A-2, A-4, A-6, A-7	0	80-95	70-95	50-95	30-75	20-45	5-20
	22-60	Very gravelly loam, gravelly loamy sand, gravelly sand.	SW, SM, GW, SW-SC	A-1, A-2, A-3	0	30-85	30-75	10-60	0-30	<25	NP-7
Delmont---------	0-4	Loam-------------	CL	A-6, A-4	0	90-100	90-100	80-95	60-75	28-40	8-20
	4-16	Loam, fine sandy loam, sandy loam.	SC, CL, CL-ML, SM-SC	A-4, A-6	0	80-100	70-100	50-100	35-70	20-40	5-18
	16-60	Gravelly sand, gravelly loamy sand.	SM, SW-SM, SM-SC, SW	A-1, A-2	0-5	60-100	40-80	15-50	3-30	<25	NP-5
OkF-------------- Okaton	0-4	Silty clay-------	CH, MH	A-7	0	100	95-100	90-100	85-100	50-85	20-50
	4-16	Clay, silty clay, shaly clay.	CH, MH	A-7	0	100	95-100	90-100	85-100	50-85	20-50
	16-60	Weathered bedrock	CH, MH	A-7	0	100	95-100	90-100	85-100	50-100	20-65
OpB, OpC--------- Opal	0-4	Clay-------------	CH, MH	A-7	0	100	100	90-100	80-100	60-80	25-45
	4-21	Clay-------------	CH, MH	A-7	0	100	100	90-100	80-100	65-85	30-50
	21-32	Clay, shaly clay, very shaly clay.	CH, MH	A-7	0	100	95-100	90-100	80-100	65-85	30-50
	32-60	Weathered bedrock	CH, MH	A-7	0	100	95-100	90-100	85-100	60-95	25-60
OsD*:											
Opal------------	0-4	Clay-------------	CH, MH	A-7	0	100	100	90-100	80-100	60-80	25-45
	4-21	Clay-------------	CH, MH	A-7	0	100	100	90-100	80-100	65-85	30-50
	21-32	Clay, shaly clay, very shaly clay.	CH, MH	A-7	0	100	95-100	90-100	80-100	65-85	30-50
	32-60	Weathered bedrock	CH, MH	A-7	0	100	95-100	90-100	85-100	60-95	25-60
Sansarc---------	0-4	Clay-------------	CH, MH	A-7	0	100	95-100	90-100	75-100	60-90	25-55
	4-15	Shaly clay, very shaly clay, clay.	CH, MH	A-7	0	80-100	75-100	75-100	75-100	60-90	25-55
	15-60	Weathered bedrock	CH, MH	A-7	0	100	100	90-100	80-100	60-90	25-55
Pa*. Pits											
Pk--------------- Plankinton	0-7	Silt loam--------	ML, CL	A-4, A-6	0	100	100	90-100	80-100	27-40	5-15
	7-28	Clay, silty clay, clay loam.	CH, MH, CL, ML	A-7	0	100	95-100	90-100	70-100	40-70	15-35
	28-60	Clay, silty clay, clay loam.	CH, CL	A-6, A-7	0	95-100	90-100	85-100	65-100	30-60	15-30
PrA, PrB--------- Promise	0-5	Clay-------------	CH, MH	A-7	0	100	100	90-100	80-100	55-70	25-40
	5-34	Clay-------------	CH, MH	A-7	0	100	100	90-100	85-100	60-85	25-50
	34-60	Clay, silty clay	CH, MH	A-7	0	100	100	90-100	85-100	60-90	25-55
RaA, RaB--------- Raber	0-4	Loam-------------	CL	A-6	0	100	100	85-95	60-75	30-40	10-20
	4-15	Clay loam, clay	CL, CH	A-6, A-7	0	100	100	90-100	70-95	35-60	11-35
	15-60	Clay loam, clay	CL, CH	A-6, A-7	0	100	100	90-100	70-90	30-60	11-35
RcA*, RcB*:											
Raber-----------	0-4	Loam-------------	CL	A-6	0	100	100	85-95	60-75	30-40	10-20
	4-15	Clay loam, clay	CL, CH	A-6, A-7	0	100	100	90-100	70-95	35-60	11-35
	15-60	Clay loam, clay	CL, CH	A-6, A-7	0	100	100	90-100	70-90	30-60	11-35
Cavo------------	0-8	Loam-------------	CL, CL-ML	A-4, A-6	0	100	95-100	85-100	60-85	25-40	5-20
	8-14	Clay loam, clay	CL, CH	A-7	0	100	95-100	90-100	70-95	40-65	15-35
	14-60	Clay loam, clay	CL, CH	A-7, A-6	0-5	95-100	95-100	85-100	60-95	36-55	15-30

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
RgD*:											
Raber	0-4	Loam	CL	A-6	0	100	100	85-95	60-75	30-40	10-20
	4-15	Clay loam, clay	CL, CH	A-6, A-7	0	100	100	90-100	70-95	35-60	11-35
	15-60	Clay loam, clay	CL, CH	A-6, A-7	0	100	100	90-100	70-90	30-60	11-35
Gettys	0-3	Clay loam	CL, CH	A-7	0	95-100	90-100	85-100	70-85	40-60	15-30
	3-60	Clay loam, clay	CL, CH, MH	A-7	0	95-100	90-100	85-100	60-80	40-60	20-35
RhC*:											
Raber	0-4	Loam	CL	A-6	0	100	100	85-95	60-75	30-40	10-20
	4-15	Clay loam, clay	CL, CH	A-6, A-7	0	100	100	90-100	70-95	35-60	11-35
	15-60	Clay loam, clay	CL, CH	A-6, A-7	0	100	100	90-100	70-90	30-60	11-35
Peno	0-4	Loam	ML, CL	A-6, A-7, A-4	0-5	95-100	95-100	85-95	60-75	30-45	5-20
	4-9	Clay loam, clay	CL, CH	A-7	0-5	95-100	95-100	85-95	70-85	40-65	15-35
	9-60	Clay loam, clay	CL, CH, ML	A-7	0-5	95-100	95-100	85-95	70-85	45-80	20-45
Rn Ranslo	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-90	25-40	3-15
	9-16	Silty clay, silty clay loam, clay loam.	CH, CL	A-7	0	100	100	95-100	75-90	40-60	20-35
	16-25	Clay loam, silty clay, silty clay loam.	CH	A-7	0	100	100	95-100	75-95	50-75	23-42
	25-60	Clay loam, silty clay loam, sandy clay loam.	CL, CH	A-6, A-7	0	100	100	85-100	50-90	35-55	12-28
Rr*:											
Ranslo	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-90	25-40	3-15
	9-16	Silty clay, silty clay loam, clay loam.	CH, CL	A-7	0	100	100	95-100	75-90	40-60	20-35
	16-25	Clay loam, silty clay, silty clay loam.	CH	A-7	0	100	100	95-100	75-95	50-75	23-42
	25-60	Clay loam, silty clay loam, sandy clay loam.	CL, CH	A-6, A-7	0	100	100	85-100	50-90	35-55	12-28
Durrstein	0-2	Silt loam	ML, CL, CL-ML	A-4, A-6	0	100	100	85-100	60-90	20-35	3-15
	2-15	Silty clay, clay, clay loam.	CH, MH	A-7	0	95-100	95-100	85-100	65-95	50-85	20-50
	15-60	Silty clay, clay, clay loam.	CH, CL	A-7	0	95-100	95-100	85-100	60-95	40-75	15-50
RsA Ree	0-7	Loam	CL, CL-ML	A-4, A-6	0	100	95-100	80-100	70-95	25-40	5-15
	7-18	Clay loam, sandy clay loam, silty clay loam.	CL	A-6, A-7	0	100	90-100	70-100	65-85	30-45	10-20
	18-50	Clay loam, loam	CL	A-6	0	100	85-100	70-100	55-85	25-40	10-20
	50-60	Gravelly sand, gravelly loamy sand.	SM, SW-SM, SM-SC, SW	A-1, A-2	0-5	60-100	40-80	15-50	3-30	<25	NP-5
Rt Regan	0-60	Silt loam	CL, CL-ML	A-7, A-6, A-4	0	100	100	90-100	80-95	20-50	5-30
SaF Sansarc	0-4	Clay	CH, MH	A-7	0	100	95-100	90-100	75-100	60-90	25-55
	4-15	Shaly clay, very shaly clay, clay.	CH, MH	A-7	0	80-100	75-100	75-100	75-100	60-90	25-55
	15-60	Weathered bedrock	CH, MH	A-7	0	100	100	90-100	80-100	60-90	25-55

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
ScF--------------- Schamber	0-4	Gravelly loam----	SM, SW-SM, GM, GW-GM	A-2, A-1	0-5	55-90	40-75	30-60	10-35	<25	NP-5
	4-60	Gravelly sand, very gravelly sand, gravelly loamy sand.	SW, SW-SM, GW, GW-GM	A-1	0-15	30-60	15-40	5-20	0-10	<25	NP-5
Te--------------- Tetonka	0-14	Silt loam--------	ML, CL	A-4, A-6, A-7	0	100	100	95-100	80-100	27-50	5-20
	14-47	Clay, silty clay, silty clay loam.	CL, CH, MH, ML	A-7	0	95-100	95-100	85-100	65-100	40-70	15-35
	47-60	Clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	95-100	95-100	80-100	55-95	30-60	11-30
Wa--------------- Walke	0-8	Silt loam--------	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	80-100	25-40	3-15
	8-60	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	85-100	40-55	15-28
Wf--------------- Wendte	0-5	Silty clay loam	CL, CH	A-7	0	100	100	90-100	70-100	45-70	20-40
	5-60	Stratified silty clay loam to clay.	CL, CH	A-7	0	100	100	90-100	70-100	45-80	20-45
Wo--------------- Worthing	0-9	Silty clay loam	CL, CH, MH, ML	A-7	0	100	100	95-100	85-100	40-60	15-30
	9-44	Silty clay, clay	CH, MH	A-7	0	100	100	95-100	85-100	50-70	22-35
	44-60	Silty clay, silty clay loam, clay loam.	CL, CH, ML, MH	A-7	0	100	95-100	90-100	70-100	40-65	15-30
Wp--------------- Worthing	0-9	Silty clay loam	CL, CH, MH, ML	A-7	0	100	100	95-100	85-100	40-60	15-30
	9-44	Silty clay, clay	CH	A-7	0	100	100	95-100	80-100	50-70	25-40
	44-60	Silty clay, silty clay loam, clay loam.	CL, CH, ML, MH	A-7	0	100	95-100	90-100	70-100	40-65	15-30

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[*] See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cm3	In/hr	In/in	pH	mmhos/cm					Pct
AgA, AgB Agar	0-5	20-26	1.15-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.32	5	6	2-4
	5-20	25-35	1.15-1.25	0.6-2.0	0.17-0.22	6.6-7.8	<2	Moderate	0.43			
	20-60	20-30	1.20-1.35	0.6-2.0	0.17-0.20	7.4-9.0	<2	Low	0.43			
AmA*:												
Agar	0-5	20-26	1.15-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.32	5	6	2-4
	5-20	25-35	1.15-1.25	0.6-2.0	0.17-0.22	6.6-7.8	<2	Moderate	0.43			
	20-60	20-30	1.20-1.35	0.6-2.0	0.17-0.20	7.4-9.0	<2	Low	0.43			
Mobridge	0-10	20-26	1.10-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Low	0.32	5	6	4-6
	10-28	27-35	1.15-1.30	0.6-2.0	0.19-0.22	6.6-7.8	<2	Moderate	0.32			
	28-60	25-32	1.20-1.35	0.6-2.0	0.17-0.20	7.4-8.4	<2	Moderate	0.43			
AoA*:												
Agar	0-5	20-26	1.15-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.32	5	6	2-4
	5-20	25-35	1.15-1.25	0.6-2.0	0.17-0.22	6.6-7.8	<2	Moderate	0.43			
	20-60	20-30	1.20-1.35	0.6-2.0	0.17-0.20	7.4-9.0	<2	Low	0.43			
Mobridge	0-10	20-26	1.10-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Low	0.32	5	6	4-6
	10-28	27-35	1.15-1.30	0.6-2.0	0.19-0.22	6.6-7.8	<2	Moderate	0.32			
	28-60	25-32	1.20-1.35	0.6-2.0	0.17-0.20	7.4-8.4	<2	Moderate	0.43			
Tetonka	0-14	20-27	1.10-1.25	0.6-2.0	0.19-0.22	5.6-7.3	<2	Moderate	0.24	3	6	2-4
	14-47	35-60	1.20-1.35	<0.2	0.13-0.19	6.1-7.8	<2	High	0.32			
	47-60	30-50	1.35-1.50	0.06-0.6	0.11-0.17	6.6-8.4	2-8	High	0.32			
BgE*:												
Betts	0-4	18-27	1.20-1.30	0.6-2.0	0.16-0.18	6.6-8.4	<2	Moderate	0.20	5	8	2-4
	4-23	20-35	1.20-1.35	0.6-2.0	0.17-0.20	7.4-8.4	<2	Moderate	0.37			
	23-60	20-35	1.50-1.70	0.2-0.6	0.17-0.20	7.4-8.4	2-8	Moderate	0.37			
Gettys	0-3	30-45	1.25-1.35	0.2-0.6	0.16-0.19	6.6-7.8	<2	High	0.28	5	8	1-3
	3-60	30-50	1.50-1.70	0.2-0.6	0.11-0.17	7.4-8.4	<4	High	0.28			
BkE*:												
Betts	0-4	18-27	1.20-1.30	0.6-2.0	0.16-0.18	6.6-8.4	<2	Moderate	0.28	5	4L	1-3
	4-23	20-35	1.20-1.35	0.6-2.0	0.17-0.20	7.4-8.4	<2	Moderate	0.37			
	23-60	20-35	1.50-1.70	0.2-0.6	0.17-0.20	7.4-8.4	2-8	Moderate	0.37			
Java	0-4	20-30	1.20-1.30	0.6-2.0	0.18-0.22	6.6-7.8	<2	Moderate	0.28	5	6	1-3
	4-9	20-32	1.25-1.35	0.6-2.0	0.18-0.22	6.6-7.8	<2	Moderate	0.37			
	9-34	18-30	1.25-1.35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.37			
	34-60	20-30	1.50-1.70	0.2-0.6	0.16-0.20	7.4-8.4	<8	Moderate	0.37			
Bo, Bv Bon	0-8	20-27	1.20-1.30	0.6-2.0	0.19-0.22	6.6-8.4	<2	Low	0.24	5	6	4-6
	8-23	20-30	1.25-1.40	0.6-2.0	0.13-0.17	7.4-8.4	<2	Low	0.32			
	23-60	15-30	1.25-1.40	0.6-6.0	0.11-0.16	7.4-8.4	<2	Low	0.32			
CaA Cavo	0-8	20-26	1.00-1.20	0.6-2.0	0.18-0.22	6.1-7.3	<2	Low	0.32	3	6	1-3
	8-14	35-50	1.25-1.35	<0.2	0.10-0.15	7.4-8.4	2-8	High	0.32			
	14-60	27-42	1.30-1.55	0.06-0.6	0.08-0.14	7.9-9.0	4-16	Moderate	0.32			
Da Davison	0-12	18-30	1.15-1.30	0.6-2.0	0.18-0.20	6.6-8.4	<2	Moderate	0.28	5	4L	2-4
	12-30	18-30	1.20-1.35	0.6-2.0	0.13-0.17	7.4-9.0	<2	Moderate	0.37			
	30-60	18-30	1.25-1.35	0.6-2.0	0.16-0.20	7.4-8.4	2-8	Moderate	0.37			
De DeGrey	0-9	18-25	1.00-1.20	0.6-2.0	0.19-0.22	6.1-7.3	<2	Low	0.37	3	6	2-4
	9-20	35-55	1.30-1.45	<0.2	0.14-0.19	6.6-8.4	2-8	High	0.37			
	20-39	35-45	1.35-1.45	0.06-0.6	0.11-0.17	7.4-8.4	2-8	High	0.37			
	39-60	25-40	1.50-1.65	0.2-0.6	0.14-0.18	7.9-9.0	4-16	Moderate	0.37			
DmA Delmont	0-4	20-27	1.20-1.30	0.6-2.0	0.18-0.20	6.1-7.8	<2	Low	0.28	3	6	2-4
	4-16	18-30	1.20-1.35	0.6-6.0	0.12-0.18	6.1-7.8	<2	Low	0.28			
	16-60	0-5	1.60-1.75	6.0-20	0.03-0.06	7.4-8.4	<2	Low	0.10			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cm^3	In/hr	In/in	pH	mmhos/cm					Pct
DsD*:												
Delmont	0-4	20-27	1.20-1.30	0.6-2.0	0.18-0.20	6.1-7.8	<2	Low	0.28	3	6	2-4
	4-16	18-30	1.20-1.35	0.6-6.0	0.12-0.18	6.1-7.8	<2	Low	0.28			
	16-60	0-5	1.60-1.75	6.0-20	0.03-0.06	7.4-8.4	<2	Low	0.10			
Schamber	0-4	18-25	1.40-1.60	>6.0	0.03-0.06	6.1-8.4	<2	Low	0.17	2	6	.5-2
	4-60	2-10	1.40-1.65	>6.0	0.03-0.06	7.4-8.4	<2	Low	0.10			
Du Durrstein	0-2	10-26	1.15-1.30	0.6-2.0	0.17-0.20	6.1-7.3	4-16	Low	0.37	1	6	1-3
	2-15	35-60	1.20-1.35	<0.2	0.10-0.15	6.6-9.0	4-16	High	0.37			
	15-60	35-55	1.35-1.50	<0.2	0.08-0.13	>7.3	4-16	High	0.37			
EaA Eakin	0-7	20-26	1.10-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.32	5	6	2-4
	7-30	28-35	1.15-1.25	0.6-2.0	0.18-0.21	6.6-8.4	<2	Moderate	0.43			
	30-60	25-45	1.50-1.70	0.2-0.6	0.16-0.20	7.4-9.0	<4	Moderate	0.43			
EpB*, EpC*:												
Eakin	0-7	20-26	1.10-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.32	5	6	2-4
	7-30	28-35	1.15-1.25	0.6-2.0	0.18-0.21	6.6-8.4	<2	Moderate	0.43			
	30-60	25-45	1.50-1.70	0.2-0.6	0.16-0.20	7.4-9.0	<4	Moderate	0.43			
Peno	0-4	20-27	1.20-1.30	0.6-2.0	0.18-0.20	6.6-7.3	<2	Moderate	0.28	5	6	2-4
	4-9	35-45	1.30-1.45	0.2-0.6	0.13-0.19	6.6-7.8	<2	High	0.28			
	9-60	35-45	1.50-1.70	0.2-0.6	0.11-0.17	7.9-9.0	2-8	High	0.28			
GeF Gettys	0-3	30-45	1.25-1.35	0.2-0.6	0.16-0.19	6.6-8.4	<2	High	0.28	5	4L	1-3
	3-60	30-50	1.50-1.70	0.2-0.6	0.11-0.17	7.4-8.4	<4	High	0.28			
GlA Glenham	0-4	20-26	1.20-1.30	0.6-2.0	0.18-0.22	6.1-7.3	<2	Moderate	0.28	5	6	2-4
	4-14	25-34	1.30-1.45	0.6-2.0	0.18-0.22	6.6-7.8	<2	Moderate	0.28			
	14-60	20-34	1.50-1.70	0.2-0.6	0.16-0.20	7.4-8.4	<4	Moderate	0.37			
GpB*:												
Glenham	0-4	20-26	1.20-1.30	0.6-2.0	0.18-0.22	6.1-7.3	<2	Moderate	0.28	5	6	2-4
	4-14	25-34	1.30-1.45	0.6-2.0	0.18-0.22	6.6-7.8	<2	Moderate	0.28			
	14-60	20-34	1.50-1.70	0.2-0.6	0.16-0.20	7.4-8.4	<4	Moderate	0.37			
Plankinton	0-7	15-27	1.10-1.25	0.6-2.0	0.19-0.22	5.6-7.3	<2	Moderate	0.24	3	6	3-6
	7-28	38-60	1.20-1.35	<0.2	0.10-0.22	6.1-8.4	<2	High	0.32			
	28-60	35-60	1.35-1.50	0.06-0.6	0.08-0.17	6.6-8.4	2-8	High	0.32			
GrA*, GrB*:												
Glenham	0-4	20-26	1.20-1.30	0.6-2.0	0.18-0.22	6.1-7.3	<2	Moderate	0.28	5	6	2-4
	4-14	25-34	1.30-1.45	0.6-2.0	0.18-0.22	6.6-7.8	<2	Moderate	0.28			
	14-60	20-34	1.50-1.70	0.2-0.6	0.16-0.20	7.4-8.4	<4	Moderate	0.37			
Prosper	0-13	20-26	1.15-1.25	0.6-2.0	0.18-0.22	5.6-7.8	<2	Moderate	0.28	5	6	4-6
	13-29	27-35	1.20-1.30	0.6-2.0	0.19-0.22	6.6-7.8	<2	Moderate	0.28			
	29-36	20-30	1.30-1.60	0.6-2.0	0.17-0.20	7.4-8.4	2-4	Moderate	0.28			
	36-60	20-30	1.45-1.65	0.2-0.6	0.17-0.20	7.4-8.4	2-8	Moderate	0.37			
HbA, HbB, HbC Highmore	0-5	20-26	1.10-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.32	5	6	2-4
	5-22	25-35	1.40-1.50	0.6-2.0	0.18-0.21	6.6-8.4	<2	Moderate	0.43			
	22-60	20-34	1.40-1.50	0.6-2.0	0.17-0.20	7.4-8.4	<2	Low	0.43			
HdA*:												
Highmore	0-5	20-26	1.10-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.32	5	6	2-4
	5-22	25-35	1.40-1.50	0.6-2.0	0.18-0.21	6.6-8.4	<2	Moderate	0.43			
	22-60	20-34	1.40-1.50	0.6-2.0	0.17-0.20	7.4-8.4	<2	Low	0.43			
DeGrey	0-9	18-25	1.00-1.20	0.6-2.0	0.19-0.22	6.1-7.3	<2	Low	0.37	3	6	2-4
	9-20	35-55	1.30-1.45	<0.2	0.14-0.19	6.6-8.4	2-8	High	0.37			
	20-39	35-45	1.35-1.45	0.06-0.6	0.11-0.17	7.4-8.4	2-8	High	0.37			
	39-60	25-40	1.50-1.65	0.2-0.6	0.14-0.18	7.9-9.0	4-16	Moderate	0.37			
HfA*:												
Highmore	0-5	20-26	1.10-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.32	5	6	2-4
	5-22	25-35	1.40-1.50	0.6-2.0	0.18-0.21	6.6-8.4	<2	Moderate	0.43			
	22-60	20-34	1.40-1.50	0.6-2.0	0.17-0.20	7.4-8.4	<2	Low	0.43			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodi-bility group	Organic matter
	In	Pct	g/cm^3	In/hr	In/in	pH	mmhos/cm		K	T		Pct
HfA*: Mobridge--------	0-10	20-26	1.10-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Low-------	0.32	5	6	4-6
	10-28	27-35	1.15-1.30	0.6-2.0	0.19-0.22	6.6-7.8	<2	Moderate	0.32			
	28-60	25-32	1.20-1.35	0.6-2.0	0.17-0.20	7.4-8.4	<2	Moderate	0.43			
HgB*, HgC*: Highmore--------	0-5	20-26	1.10-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.32	5	6	2-4
	5-22	25-35	1.40-1.50	0.6-2.0	0.18-0.21	6.6-8.4	<2	Moderate	0.43			
	22-60	20-34	1.40-1.50	0.6-2.0	0.17-0.20	7.4-8.4	<2	Low-------	0.43			
Peno------------	0-4	20-27	1.20-1.30	0.6-2.0	0.18-0.20	6.6-7.3	<2	Moderate	0.28	5	8	2-4
	4-9	35-45	1.30-1.45	0.2-0.6	0.13-0.19	6.6-7.8	<2	High------	0.28			
	9-6C	35-45	1.50-1.70	0.2-0.6	0.11-0.17	7.9-9.0	2-8	High------	0.28			
Ho--------------- Hoven	0-4	22-26	1.15-1.25	0.6-2.0	0.19-0.22	5.6-7.3	<2	Moderate	0.37	1	7	2-4
	4-10	35-60	1.15-1.30	<0.06	0.10-0.19	6.1-7.8	4-16	High------	0.37			
	10-30	35-60	1.15-1.30	<0.06	0.10-0.19	7.4-8.4	4-16	High------	0.37			
	30-60	35-60	1.30-1.50	<0.2	0.08-0.17	7.4-9.0	4-16	High------	0.37			
Hu--------------- Hurley	0-3	20-26	1.10-1.20	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.43	1	6	1-2
	3-25	60-70	1.30-1.45	<0.06	0.05-0.13	7.4-9.0	4-16	Very high	0.43			
	25-60	---	---	<0.06	---	6.1-8.4	<2	Very high	----			
Hz*: Hurley----------	0-4	20-26	1.10-1.20	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.43	1	6	1-2
	4-25	60-70	1.30-1.45	<0.06	0.05-0.13	7.4-9.0	4-16	Very high	0.43			
	25-60	---	---	<0.06	---	6.1-8.4	<2	Very high	----			
Slickspots.												
JbC*: Java------------	0-4	20-30	1.20-1.30	0.6-2.0	0.18-0.22	6.6-7.8	<2	Moderate	0.28	5	6	1-3
	4-9	20-32	1.25-1.35	0.6-2.0	0.18-0.22	6.6-7.8	<2	Moderate	0.37			
	9-34	18-30	1.25-1.35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.37			
	34-60	20-30	1.50-1.70	0.2-0.6	0.16-0.20	7.4-8.4	<8	Moderate	0.37			
Betts-----------	0-4	18-27	1.20-1.30	0.6-2.0	0.16-0.18	6.6-8.4	<2	Moderate	0.28	5	4L	1-3
	4-23	20-35	1.20-1.35	0.6-2.0	0.17-0.20	7.4-8.4	<2	Moderate	0.37			
	23-60	20-35	1.50-1.70	0.2-0.6	0.17-0.20	7.4-8.4	2-8	Moderate	0.37			
JgB*: Java------------	0-4	20-30	1.20-1.30	0.6-2.0	0.18-0.22	6.6-7.8	<2	Moderate	0.28	5	6	1-3
	4-9	20-32	1.25-1.35	0.6-2.0	0.18-0.22	6.6-7.8	<2	Moderate	0.37			
	9-34	18-30	1.25-1.35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.37			
	34-60	20-30	1.50-1.70	0.2-0.6	0.16-0.20	7.4-8.4	<8	Moderate	0.37			
Glenham---------	0-4	20-26	1.20-1.30	0.6-2.0	0.18-0.22	6.1-7.3	<2	Moderate	0.28	5	6	2-4
	4-14	25-34	1.30-1.45	0.6-2.0	0.18-0.22	6.6-7.8	<2	Moderate	0.28			
	14-60	20-34	1.50-1.70	0.2-0.6	0.16-0.20	7.4-8.4	<4	Moderate	0.37			
JmE*: Java------------	0-4	20-30	1.20-1.30	0.6-2.0	0.18-0.22	6.6-7.8	<2	Moderate	0.28	5	6	1-3
	4-9	20-32	1.25-1.35	0.6-2.0	0.18-0.22	6.6-7.8	<2	Moderate	0.37			
	9-34	18-30	1.25-1.35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Moderate	0.37			
	34-60	20-30	1.50-1.70	0.2-0.6	0.16-0.20	7.4-8.4	<8	Moderate	0.37			
Schamber--------	0-4	18-25	1.40-1.60	>6.0	0.03-0.06	6.1-8.4	<2	Low-------	0.17	2	6	.5-2
	4-60	2-10	1.40-1.65	>6.0	0.03-0.06	7.4-8.4	<2	Low-------	0.10			
Jr--------------- Jerauld	0-3	15-25	1.10-1.25	0.6-2.0	0.18-0.22	5.6-7.3	<4	Moderate	0.43	1	6	1-3
	3-8	35-60	1.15-1.30	<0.2	0.10-0.15	6.6-8.4	2-8	High------	0.32			
	8-13	35-60	1.15-1.30	<0.2	0.10-0.15	7.9-9.0	4-16	High------	0.32			
	13-60	27-45	1.35-1.60	<0.2	0.08-0.13	7.4-9.0	4-16	High------	0.32			
LoA, LoB, LoC---- Lowry	0-5	18-22	1.10-1.20	0.6-2.0	0.19-0.22	6.6-7.8	<2	Low-------	0.32	5	5	2-4
	5-11	18-22	1.10-1.25	0.6-2.0	0.19-0.22	6.6-8.4	<2	Low-------	0.32			
	11-60	15-18	1.20-1.40	0.6-2.0	0.15-0.20	7.4-8.4	<2	Low-------	0.43			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodi-bility group	Organic matter
									K	T		
	In	Pct	g/cm^3	In/hr	In/in	pH	mmhos/cm					Pct
LpC*, LpD*:												
Lowry	0-5	18-22	1.10-1.20	0.6-2.0	0.19-0.22	6.6-7.8	<2	Low	0.32	5	5	2-4
	5-11	18-22	1.10-1.25	0.6-2.0	0.19-0.22	6.6-8.4	<2	Low	0.32			
	11-60	15-18	1.20-1.40	0.6-2.0	0.15-0.20	7.4-8.4	<2	Low	0.43			
Peno	0-4	20-27	1.20-1.30	0.6-2.0	0.18-0.20	6.6-7.3	<2	Moderate	0.28	5	6	2-4
	4-9	35-45	1.30-1.45	0.2-0.6	0.13-0.19	6.6-7.8	<2	High	0.28			
	9-60	35-45	1.50-1.70	0.2-0.6	0.11-0.17	7.9-9.0	2-8	High	0.28			
Mo	0-10	20-26	1.10-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Low	0.32	5	6	4-6
Mobridge	10-28	27-35	1.15-1.30	0.6-2.0	0.19-0.22	6.6-7.8	<2	Moderate	0.32			
	28-60	25-32	1.20-1.35	0.6-2.0	0.17-0.20	7.4-8.4	<2	Moderate	0.43			
OaA, OaB	0-5	18-26	1.20-1.30	0.6-2.0	0.18-0.20	6.1-7.3	<2	Low	0.28	4	6	2-4
Oahe	5-14	18-30	1.25-1.35	0.6-2.0	0.18-0.22	6.6-7.8	<2	Low	0.28			
	14-22	18-30	1.25-1.35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Low	0.28			
	22-60	0-7	1.50-1.70	6.0-20	0.03-0.06	7.4-8.4	<2	Low	0.10			
OdB*:												
Oahe	0-5	18-26	1.20-1.30	0.6-2.0	0.18-0.20	6.1-7.3	<2	Low	0.28	4	6	2-4
	5-14	18-30	1.25-1.35	0.6-2.0	0.18-0.22	6.6-7.8	<2	Low	0.28			
	14-22	18-30	1.25-1.35	0.6-2.0	0.16-0.20	7.4-8.4	<2	Low	0.28			
	22-60	0-7	1.50-1.70	6.0-20	0.03-0.06	7.4-8.4	<2	Low	0.10			
Delmont	0-4	20-27	1.20-1.30	0.6-2.0	0.18-0.20	6.1-7.8	<2	Low	0.28	3	6	2-4
	4-16	18-30	1.20-1.35	0.6-6.0	0.12-0.18	6.1-7.8	<2	Low	0.28			
	16-60	0-5	1.60-1.75	6.0-20	0.03-0.06	7.4-8.4	<2	Low	0.10			
OkF	0-4	45-60	1.10-1.25	0.06-0.2	0.11-0.16	7.4-8.4	<2	High	0.37	2	4	1-2
Okaton	4-16	45-60	1.10-1.25	0.06-0.2	0.11-0.16	7.4-8.4	<2	High	0.37			
	16-60	---	---	<0.06	---	7.4-8.4	<2	High	----			
OpB, OpC	0-4	55-65	1.20-1.30	<0.06	0.10-0.14	6.6-7.8	<2	Very high	0.37	4	4	2-4
Opal	4-21	60-70	1.20-1.30	<0.06	0.08-0.14	7.4-8.4	<2	Very high	0.37			
	21-32	60-70	1.20-1.30	<0.06	0.08-0.12	7.4-8.4	2-4	Very high	0.37			
	32-60	---	---	<0.06	---	6.6-8.4	<2	Very high	----			
OsD*:												
Opal	0-4	55-65	1.20-1.30	<0.06	0.10-0.14	6.6-7.8	<2	Very high	0.37	4	4	2-4
	4-21	60-70	1.20-1.30	<0.06	0.08-0.14	7.4-8.4	<2	Very high	0.37			
	21-32	60-70	1.20-1.30	<0.06	0.08-0.12	7.4-8.4	2-4	Very high	0.37			
	32-60	---	---	<0.06	---	6.6-8.4	<2	Very high	----			
Sansarc	0-4	55-65	1.10-1.20	0.06-0.2	0.08-0.12	6.6-8.4	<2	Very high	0.37	2	4	1-2
	4-15	55-65	1.10-1.20	0.06-0.2	0.08-0.12	7.4-8.4	<2	Very high	0.37			
	15-60	---	---	---	---	5.6-8.4	---	----------	----			
Pa*.												
Pits												
Pk	0-7	15-27	1.10-1.25	0.6-2.0	0.19-0.22	5.6-7.3	<2	Moderate	0.24	3	6	3-6
Plankinton	7-28	38-60	1.20-1.35	<0.2	0.10-0.22	6.1-8.4	<2	High	0.32			
	28-60	35-60	1.35-1.50	0.06-0.6	0.08-0.17	6.6-8.4	2-8	High	0.32			
PrA, PrB	0-5	50-60	1.20-1.30	<0.2	0.10-0.14	6.1-7.8	<2	Very high	0.37	5	4	2-4
Promise	5-34	60-70	1.20-1.30	<0.2	0.08-0.14	7.4-9.0	<2	Very high	0.37			
	34-60	50-65	1.15-1.30	<0.2	0.10-0.12	7.4-9.0	2-4	Very high	0.37			
RaA, RaB	0-4	23-26	1.15-1.30	0.6-2.0	0.18-0.20	6.1-7.3	<2	Moderate	0.28	5	6	2-4
Raber	4-15	35-45	1.25-1.40	0.06-0.6	0.13-0.19	6.6-7.8	<2	High	0.28			
	15-60	27-45	1.50-1.70	0.06-0.6	0.11-0.20	7.4-8.4	<4	High	0.37			
RcA*, RcB*:												
Raber	0-4	23-26	1.15-1.30	0.6-2.0	0.18-0.20	6.1-7.3	<2	Moderate	0.28	5	6	2-4
	4-15	35-45	1.25-1.40	0.06-0.6	0.13-0.19	6.6-7.8	<2	High	0.28			
	15-60	27-45	1.50-1.70	0.06-0.6	0.11-0.20	7.4-8.4	<4	High	0.37			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
	In	Pct	g/cm^3	In/hr	In/in	pH	mmhos/cm		K	T		Pct
RcA*, RcB*:												
Cavo------------	0-8	20-26	1.00-1.20	0.6-2.0	0.18-0.22	6.1-7.3	<2	Low-------	0.32	3	6	1-3
	8-14	35-50	1.25-1.35	<0.2	0.10-0.15	7.4-8.4	2-8	High------	0.32			
	14-60	27-42	1.30-1.55	0.06-0.6	0.08-0.14	7.9-9.0	4-16	Moderate	0.32			
RgD*:												
Raber-----------	0-4	23-26	1.15-1.30	0.6-2.0	0.18-0.20	6.1-7.3	<2	Moderate	0.28	5	6	2-4
	4-15	35-45	1.25-1.40	0.06-0.6	0.13-0.19	6.6-7.8	<2	High------	0.28			
	15-60	27-45	1.50-1.70	0.06-0.6	0.11-0.20	7.4-8.4	<4	High------	0.37			
Gettys----------	0-3	30-45	1.25-1.35	0.2-0.6	0.16-0.19	6.6-8.4	<2	High------	0.28	5	4L	1-3
	3-60	30-50	1.50-1.70	0.2-0.6	0.11-0.17	7.4-8.4	<4	High------	0.28			
RhC*:												
Raber-----------	0-4	23-26	1.15-1.30	0.6-2.0	0.18-0.20	6.1-7.3	<2	Moderate	0.28	5	6	2-4
	4-15	35-45	1.25-1.40	0.06-0.6	0.13-0.19	6.6-7.8	<2	High------	0.28			
	15-60	27-45	1.50-1.70	0.06-0.6	0.11-0.20	7.4-8.4	<4	High------	0.37			
Peno------------	0-4	20-27	1.20-1.30	0.6-2.0	0.18-0.20	6.6-7.3	<2	Moderate	0.28	5	6	2-4
	4-9	35-45	1.30-1.45	0.2-0.6	0.13-0.19	6.6-7.8	<2	High------	0.28			
	9-60	35-45	1.50-1.70	0.2-0.6	0.11-0.17	7.9-9.0	2-8	High------	0.28			
Rn--------------- Ranslo	0-9	15-26	1.10-1.20	0.6-2.0	0.19-0.22	5.6-7.3	<2	Low-------	0.37	5	6	4-7
	9-16	35-45	1.30-1.40	0.06-0.2	0.13-0.16	6.6-8.4	2-4	High------	0.28			
	16-25	35-50	1.25-1.35	0.06-0.2	0.08-0.13	7.4-8.4	2-8	High------	0.28			
	25-60	27-40	1.20-1.35	0.2-0.6	0.14-0.17	7.4-9.0	2-8	High------	0.28			
Rr*:												
Ranslo----------	0-9	15-26	1.10-1.20	0.6-2.0	0.19-0.22	5.6-7.3	<2	Low-------	0.37	5	6	4-7
	9-16	35-45	1.30-1.40	0.06-0.2	0.13-0.16	6.6-8.4	2-4	High------	0.28			
	16-25	35-50	1.25-1.35	0.06-0.2	0.08-0.13	7.4-8.4	2-8	High------	0.28			
	25-60	27-40	1.20-1.35	0.2-0.6	0.14-0.17	7.4-9.0	2-8	High------	0.28			
Durrstein-------	0-2	10-26	1.15-1.30	0.6-2.0	0.17-0.20	6.1-7.3	4-16	Low-------	0.37	1	6	1-3
	2-15	35-60	1.20-1.35	<0.2	0.10-0.15	6.6-9.0	4-16	High------	0.37			
	15-60	35-55	1.35-1.50	<0.2	0.08-0.13	>7.3	4-16	High------	0.37			
RsA-------------- Ree	0-7	22-26	1.15-1.30	0.6-2.0	0.18-0.22	6.1-7.3	<2	Moderate	0.28	5	6	2-4
	7-18	27-35	1.20-1.35	0.6-2.0	0.17-0.22	6.6-8.4	<2	Moderate	0.28			
	18-50	15-35	1.30-1.50	0.6-2.0	0.09-0.20	7.4-8.4	<2	Moderate	0.28			
	50-60	0-5	1.60-1.75	6.0-20	0.03-0.06	7.4-8.4	<2	Low-------	0.10			
Rt--------------- Regan	0-60	18-35	1.10-1.40	0.2-2.0	0.16-0.22	7.4-8.4	<4	Moderate	0.32	5	4L	2-8
SaF-------------- Sansarc	0-4	55-65	1.10-1.20	0.06-0.2	0.08-0.12	6.6-8.4	<2	Very high	0.37	2	4	1-2
	4-15	55-65	1.10-1.20	0.06-0.2	0.08-0.12	7.4-8.4	<2	Very high	0.37			
	15-60	---	---	---	---	5.6-8.4	---	----------	----			
ScF-------------- Schamber	0-4	18-25	1.40-1.60	>6.0	0.03-0.06	6.1-8.4	<2	Low-------	0.17	2	6	.5-2
	4-60	2-10	1.40-1.65	>6.0	0.03-0.06	7.4-8.4	<2	Low-------	0.10			
Te--------------- Tetonka	0-14	20-27	1.10-1.25	0.6-2.0	0.19-0.22	5.6-7.3	<2	Moderate	0.24	3	6	2-4
	14-47	35-60	1.20-1.35	<0.2	0.13-0.19	6.1-7.8	<2	High------	0.32			
	47-60	30-50	1.35-1.50	0.06-0.6	0.11-0.17	6.6-8.4	2-8	High------	0.32			
Wa--------------- Walke	0-8	15-26	1.10-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Low-------	0.32	5	6	1-3
	8-60	35-50	1.20-1.35	0.06-0.6	0.11-0.19	6.6-8.4	<4	High------	0.32			
Wf--------------- Wendte	0-5	27-35	1.15-1.30	0.2-0.6	0.16-0.19	7.4-8.4	<2	High------	0.28	5	7	3-5
	5-60	45-55	1.20-1.40	0.06-0.2	0.11-0.17	7.4-8.4	<2	High------	0.28			
Wo--------------- Worthing	0-9	35-40	1.15-1.25	0.2-0.6	0.19-0.22	5.6-7.3	<2	Moderate	0.37	5	7	3-5
	9-44	40-60	1.25-1.40	0.06-0.2	0.13-0.18	6.1-7.3	<2	High------	0.37			
	44-60	30-50	1.35-1.50	0.2-0.6	0.11-0.17	7.4-8.4	2-8	High------	0.37			
Wp--------------- Worthing	0-9	30-40	1.15-1.25	0.2-0.6	0.19-0.22	5.6-7.3	<2	High------	0.37	5	8	---
	9-44	40-60	1.20-1.35	0.06-0.2	0.13-0.18	6.1-7.8	<2	High------	0.37			
	44-60	30-50	1.35-1.50	0.2-0.6	0.11-0.17	7.4-8.4	2-8	High------	0.37			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "occasional," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
AgA, AgB---------- Agar	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
AmA*:												
Agar--------------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
Mobridge----------	B	Occasional	Very brief	Oct-Jun	>6.0	---	---	>60	---	Moderate	High-----	Low.
AoA*:												
Agar--------------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
Mobridge----------	B	Occasional	Very brief	Oct-Jun	>6.0	---	---	>60	---	Moderate	High-----	Low.
Tetonka-----------	C/D	None---------	---	---	+1-1.0	Perched	Jan-Dec	>60	---	High-----	High-----	Moderate.
BgE*:												
Betts-------------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
Gettys------------	C	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
BkE*:												
Betts-------------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
Java--------------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
Bo---------------- Bon	B	Occasional--	Brief-----	Apr-Oct	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Bv---------------- Bon	B	Frequent----	Brief-----	Apr-Oct	2.0-6.0	Apparent	Oct-Jul	>60	---	High-----	Moderate	Low.
CaA--------------- Cavo	D	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
Da---------------- Davison	B	None---------	---	---	2.0-4.0	Perched	Mar-Jun	>60	---	High-----	High-----	Moderate.
De---------------- DeGrey	D	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
DmA--------------- Delmont	B	None---------	---	---	>6.0	---	---	>60	---	Low------	Moderate	Low.
DsD*:												
Delmont-----------	B	None---------	---	---	>6.0	---	---	>60	---	Low------	Moderate	Low.
Schamber----------	A	None---------	---	---	>6.0	---	---	>60	---	Low------	Moderate	Low.
Du---------------- Durrstein	D	Occasional	Brief-----	Apr-Oct	0-1.5	Apparent	Oct-Jun	>60	---	Moderate	High-----	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
EaA--------------- Eakin	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
EpB*, EpC*:												
Eakin------------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
Peno-------------	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
GeF--------------- Gettys	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
GlA--------------- Glenham	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
GpB*:												
Glenham----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
Plankinton-------	D	None--------	---	---	+1-1.0	Perched	Mar-Jul	>60	---	Moderate	High-----	Moderate.
GrA*, GrB*:												
Glenham----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
Prosper----------	B	Occasional	Very brief	Oct-Jun	3.0-6.0	Perched	Oct-Jun	>60	---	High-----	High-----	Moderate.
HbA, HbB, HbC----- Highmore	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
HdA*:												
Highmore---------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
DeGrey-----------	D	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
HfA*:												
Highmore---------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
Mobridge---------	B	Occasional	Very brief	Oct-Jun	>6.0	---	---	>60	---	Moderate	High-----	Low.
HgB*, HgC*:												
Highmore---------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
Peno-------------	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
Ho---------------- Hoven	D	None--------	---	---	+1-1.5	Perched	Mar-Jul	>60	---	Moderate	High-----	Moderate.
Hu---------------- Hurley	D	None--------	---	---	>6.0	---	---	20-40	Soft	Low------	High-----	Moderate.
Hz*:												
Hurley-----------	D	None--------	---	---	>6.0	---	---	20-40	Soft	Low------	High-----	Moderate.
Slickspots.												

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
JbC*:												
Java--------------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
Betts-------------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
JgB*:												
Java--------------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
Glenham-----------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
JmE*:												
Java--------------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
Schamber----------	A	None---------	---	---	>6.0	---	---	>60	---	Low------	Moderate	Low.
Jr---------------- Jerauld	D	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
LoA, LoB, LoC----- Lowry	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
LpC*, LpD*:												
Lowry-------------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Peno--------------	C	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
Mo---------------- Mobridge	B	Occasional	Very brief	Oct-Jun	>6.0	---	---	>60	---	Moderate	High-----	Low.
OaA, OaB---------- Oahe	B	None---------	---	---	>6.0	---	---	>60	---	Low------	Moderate	Low.
OdB*:												
Oahe--------------	B	None---------	---	---	>6.0	---	---	>60	---	Low------	Moderate	Low.
Delmont-----------	B	None---------	---	---	>6.0	---	---	>60	---	Low------	Moderate	Low.
OkF--------------- Okaton	D	None---------	---	---	>6.0	---	---	8-20	Soft	Low------	High-----	High.
OpB, OpC---------- Opal	D	None---------	---	---	>6.0	---	---	20-40	Soft	Low------	High-----	Moderate.
OsD*:												
Opal--------------	D	None---------	---	---	>6.0	---	---	20-40	Soft	Low------	High-----	Moderate.
Sansarc-----------	D	None---------	---	---	>6.0	---	---	4-20	Soft	Low------	High-----	Moderate.
Pa*. Pits												
Pk---------------- Plankinton	D	None---------	---	---	+1-1.0	Perched	Mar-Jul	>60	---	Moderate	High-----	Moderate.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
PrA, PrB----------- Promise	D	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
RaA, RaB----------- Raber	C	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
RcA*, RcB*:												
Raber-------------	C	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
Cavo--------------	D	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
RgD*:												
Raber-------------	C	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
Gettys------------	C	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
RhC*:												
Raber-------------	C	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
Peno--------------	C	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
Rn---------------- Ranslo	D	Occasional	Very brief	Apr-Oct	1.0-3.0	Apparent	Apr-Jun	>60	---	High-----	High-----	Moderate.
Rr*:												
Ranslo------------	D	Occasional	Very brief	Apr-Oct	1.0-3.0	Apparent	Apr-Jun	>60	---	High-----	High-----	Moderate.
Durrstein---------	D	Occasional	Brief-----	Apr-Oct	0-1.5	Apparent	Oct-Jun	>60	---	Moderate	High-----	High.
RsA--------------- Ree	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Rt---------------- Regan	B/D	Frequent----	Brief to long.	Mar-Jun	0-1.0	Apparent	Oct-Jun	>60	---	High-----	High-----	Low.
SaF--------------- Sansarc	D	None---------	---	---	>6.0	---	---	4-20	Soft	Low------	High-----	Moderate.
ScF--------------- Schamber	A	None---------	---	---	>6.0	---	---	>60	---	Low------	Moderate	Low.
Te---------------- Tetonka	C/D	None---------	---	---	+1-1.0	Perched	Jan-Dec	>60	---	High-----	High-----	Moderate.
Wa---------------- Walke	C	None---------	---	---	>6.0	---	---	>60	---	Low------	High-----	Moderate.
Wf---------------- Wendte	D	Frequent----	Brief-----	Apr-Oct	>6.0	---	---	>60	---	Low------	High-----	Low.
Wo---------------- Worthing	D	None---------	---	---	+1-1.0	Perched	Jan-Dec	>60	---	High-----	High-----	Moderate.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
Wp---------------- Worthing	D	None---------	---	---	+3-0.5	Perched	Jan-Dec	>60	---	High-----	High-----	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--ENGINEERING INDEX TEST DATA

[Dashes indicate data were not available]

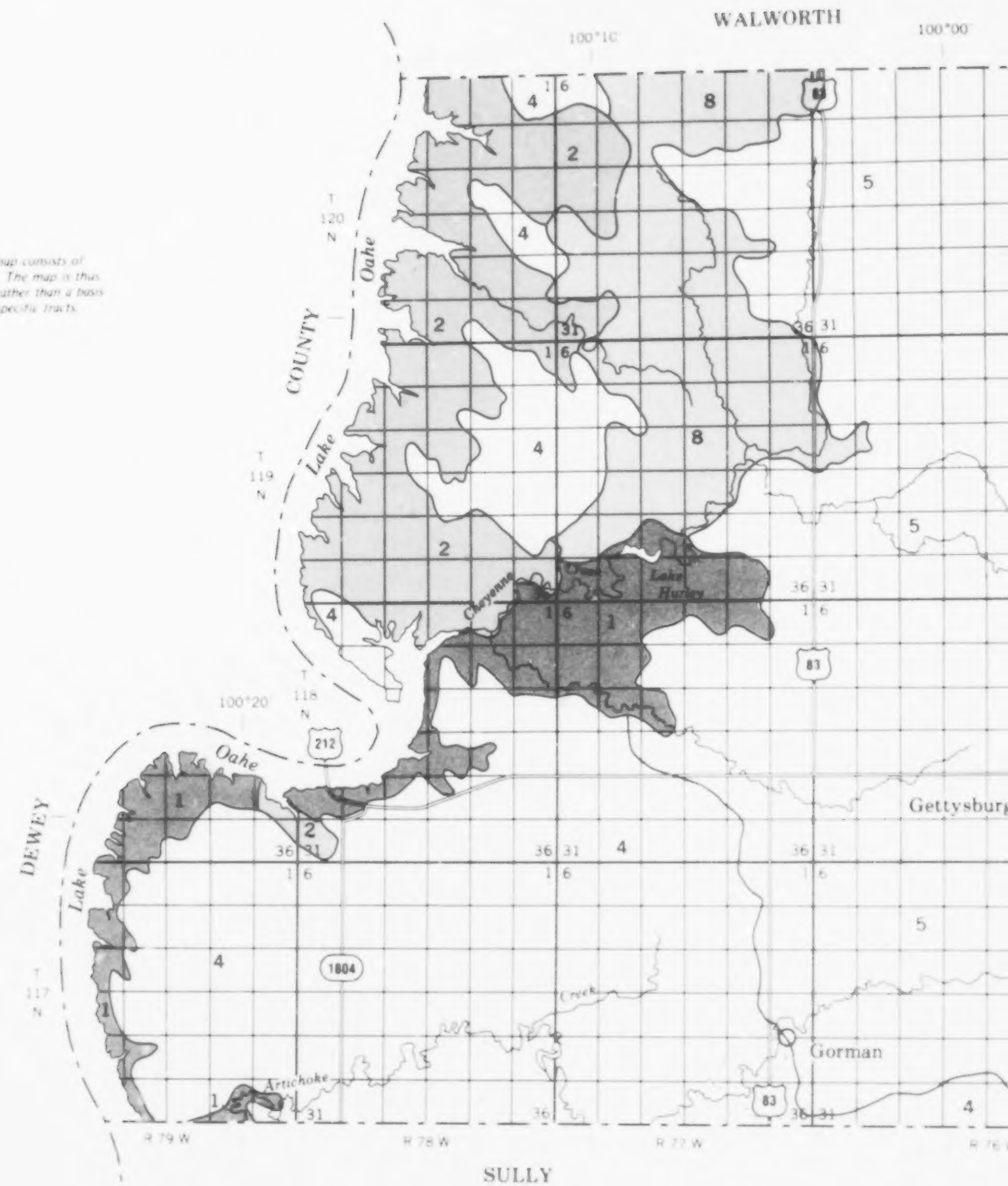
Soil name, horizon, and depth in inches	Classification		Grain-size distribution								Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve--					Percentage smaller than--						
	AASHTO	Unified	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Max. dry density	Optimum moisture
											Pct		Lb/ft^3	Pct
Agar silt loam:														
A-------0 to 5	A-7-6(10)	ML	100	100	100	100	98	--	24	--	41	14	90	27
Bt1-----5 to 11	A-7-6(12)	CL	100	100	100	100	98	--	32	--	42	20	99	22
Bt2---11 to 20	A-7-6(13)	CL	100	100	100	100	98	--	34	--	43	21	99	22
Ck-----29 to 38	A-6(12)	CL	100	100	100	100	96	--	32	--	40	20	107	18
C------38 to 60	A-7-6(13)	CL	100	100	100	100	94	--	30	--	41	22	107	18
DeGrey silt loam:														
A1------0 to 4	A-6(9)	ML	100	100	100	100	98	--	24	--	39	11	86	30
Bt1-----9 to 14	A-7-6(19)	CH	100	100	100	100	98	--	42	--	55	31	95	24
C2-----30 to 39	A-7-6(15)	CL	100	100	100	100	98	--	40	--	47	26	101	21
Highmore silt loam:														
Ap------0 to 5	A-6(9)	ML	100	100	100	100	97	--	30	--	36	12	97	23
Bt1-----5 to 11	A-6(11)	CL	100	100	100	100	96	--	32	--	39	17	97	23
Bt2---11 to 24	A-6(12)	CL	100	100	100	100	96	--	34	--	40	19	102	20
C1-----29 to 45	A-6(12)	CL	100	100	100	100	98	--	36	--	38	19	108	18
Mobridge silt loam:														
Ap------0 to 7	A-7-6(1)	ML	100	100	100	100	98	--	30	--	44	15	88	30
Bt-----18 to 27	A-7-6(14)	CL	100	100	100	100	97	--	38	--	45	22	100	22
2C-----43 to 60	A-6(12)	CL	100	99	98	97	92	--	29	--	38	19	108	18
Walke silt loam:														
A1------0 to 4	A-6(9)	ML	100	100	100	100	98	--	22	--	38	11	91	26
Bt-----16 to 24	A-7-6(12)	CL	100	100	100	100	98	--	36	--	41	20	99	22
Ck-----44 to 55	A-7-6(14)	CL	100	100	100	99	96	--	44	--	49	28	99	22

TABLE 19.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Agar	Fine-silty, mixed, mesic Typic Argiustolls
Betts	Fine-loamy, mixed (calcareous), mesic Typic Ustorthents
Bon	Fine-loamy, mixed, mesic Cumulic Haplustolls
Cavo	Fine, montmorillonitic, mesic Typic Natrustolls
Davison	Fine-loamy, mixed, mesic Aquic Calciustolls
DeGrey	Fine, montmorillonitic, mesic Typic Natrustolls
Delmont	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Haplustolls
Durrstein	Fine, montmorillonitic, mesic Typic Natraquolls
Eakin	Fine-silty, mixed, mesic Typic Argiustolls
Gettys	Fine, montmorillonitic (calcareous), mesic Typic Ustorthents
Glenham	Fine-loamy, mixed, mesic Typic Argiustolls
Highmore	Fine-silty, mixed, mesic Typic Argiustolls
Hoven	Fine, montmorillonitic, mesic Typic Natraquolls
Hurley	Very fine, montmorillonitic, mesic Leptic Natrustolls
Java	Fine-loamy, mixed, mesic Entic Haplustolls
Jerauld	Fine, montmorillonitic, mesic Leptic Natrustolls
Lowry	Coarse-silty, mixed, mesic Typic Haplustolls
Mobridge	Fine-silty, mixed, mesic Pachic Argiustolls
Oahe	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Haplustolls
Okaton	Clayey, montmorillonitic (calcareous), mesic, shallow Typic Ustorthents
Opal	Very fine, montmorillonitic, mesic Vertic Haplustolls
Peno	Fine, montmorillonitic, mesic Typic Argiustolls
Plankinton	Fine, montmorillonitic, mesic Typic Argialbolls
Promise	Very fine, montmorillonitic, mesic Vertic Haplustolls
Prosper	Fine-loamy, mixed, mesic Pachic Argiustolls
Raber	Fine, montmorillonitic, mesic Typic Argiustolls
Ranslo	Fine, montmorillonitic, frigid Typic Natraquolls
Ree	Fine-loamy, mixed, mesic Typic Argiustolls
Regan	Fine-silty, frigid Typic Calciaquolls
Sansarc	Clayey, montmorillonitic (calcareous), mesic, shallow Typic Ustorthents
*Schamber	Sandy-skeletal, mixed, mesic Ustic Torriorthents
Tetonka	Fine, montmorillonitic, mesic Argiaquic Argialbolls
Walke	Fine, montmorillonitic, mesic Glossic Natrustolls
Wendte	Fine, montmorillonitic (calcareous), mesic Vertic Ustifluvents
Worthing	Fine, montmorillonitic, mesic Typic Argiaquolls

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.


WALWORTH
100°10'
100°00'
T 120 N
T 119 N
T 118 N
T 117 N
100°20'
COUNTY
Oahe
Lake
DEWEY
Cheyenne
Lake Hurley
Gettysburg
Gorman
Creek
Artichoke
83
212
1804
R 79 W
R 78 W
R 77 W
R 76
SULLY
1
2
4
5
8
36 31
1 6

SOIL LEGEND*

UNDULATING TO VERY STEEP, LOAMY, CLAYEY, AND STONY SOILS ON UPLANDS

1 Betts-Gettys association: Well drained, strongly sloping to very steep, loamy and stony soils on uplands

2 Sansarc association: Well drained, strongly sloping to steep, clayey soils on uplands

3 Java-Betts-Glenham association: Well drained, undulating to moderately steep, loamy soils on uplands

NEARLY LEVEL TO MODERATELY SLOPING, SILTY SOILS ON UPLANDS

4 Agar association: Well drained, nearly level to undulating, silty soils on uplands

5 Highmore association: Well drained, nearly level to moderately sloping, silty soils on uplands

NEARLY LEVEL TO

6 Glenham-Java assoc
uplands

7 Raber-Cavo associat
and moderately well
loamy soils; on upla

NEARLY LEVEL TO

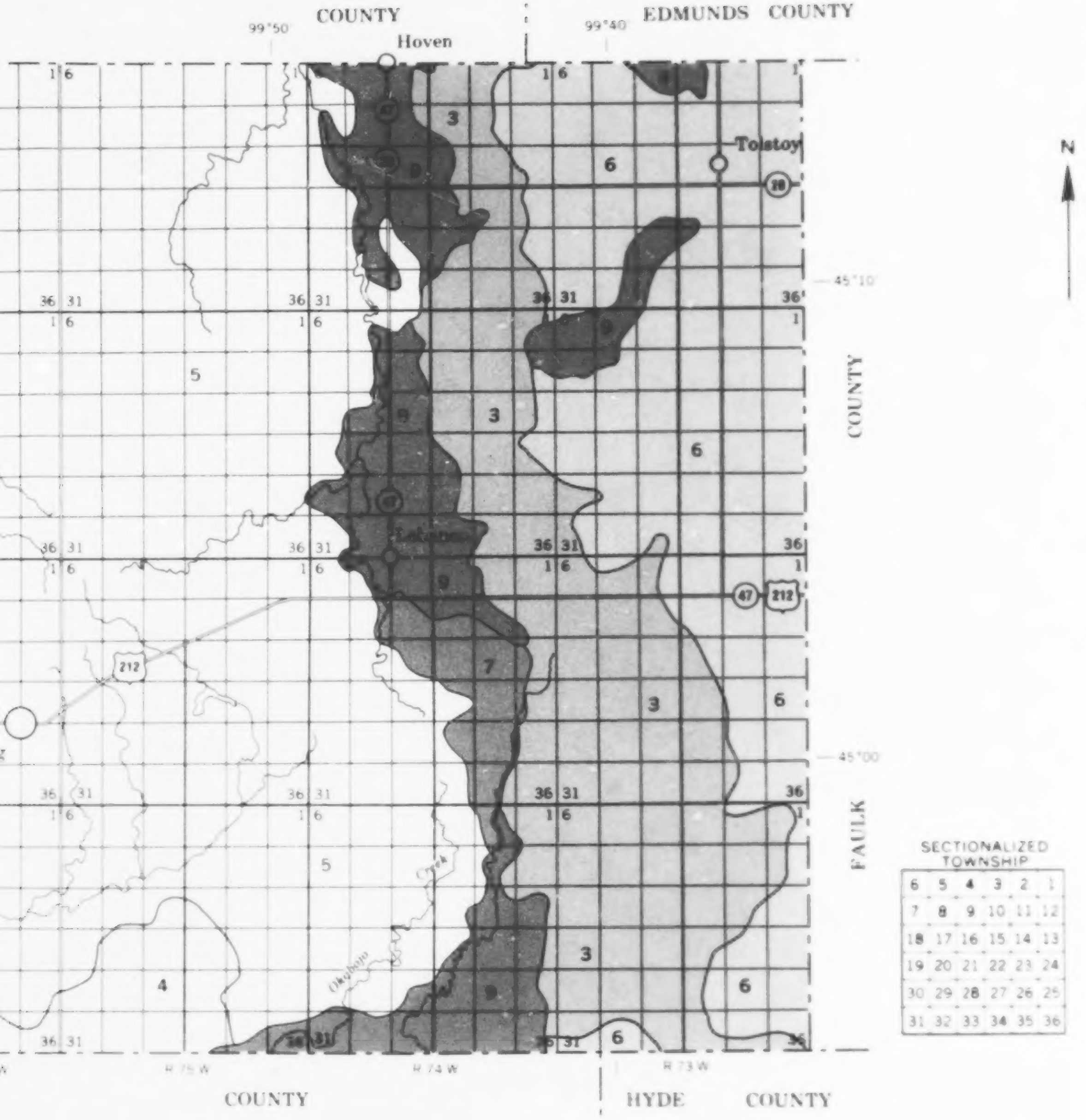
8 Promise-Opal associ
clayey soils on uplan

NEARLY LEVEL TO
OUTWASH PLAINS,

9 Oahe-Durrstein asso
soils on outwash pla
affected, silty soils o

*The texture terms in the descriptive headings refer to the surface lay
the major soils in each association.

Compiled 1983


COUNTY
EDMUNDS COUNTY
99°50'
99°40'
Hoven
Tolstoy
45°10'
45°00'
5
3
6
9
7
4
47
212
20
Okobojo Creek
COUNTY
FAULK
COUNTY
HYDE COUNTY
R 75 W
R 74 W
R 73 W
N
SECTIONALIZED TOWNSHIP
6 5 4 3 2 1
7 8 9 10 11 12
18 17 16 15 14 13
19 20 21 22 23 24
30 29 28 27 26 25
31 32 33 34 35 36

HILLY, LOAMY SOILS ON UPLANDS

iation Well drained, nearly level to hilly, loamy soils on

ion Well drained, nearly level to gently rolling, loamy soils
drained, nearly level to gently sloping, sodium affected,
nds

MODERATELY SLOPING, CLAYEY SOILS ON UPLANDS

ation Well drained, nearly level to moderately sloping,
ds

GENTLY SLOPING, LOAMY AND SILTY SOILS ON
TERRACES, AND FLOOD PLAINS

ciation: Well drained, nearly level to gently sloping, loamy
ins and terraces and poorly drained, nearly level, sodium
n flood plains

er of

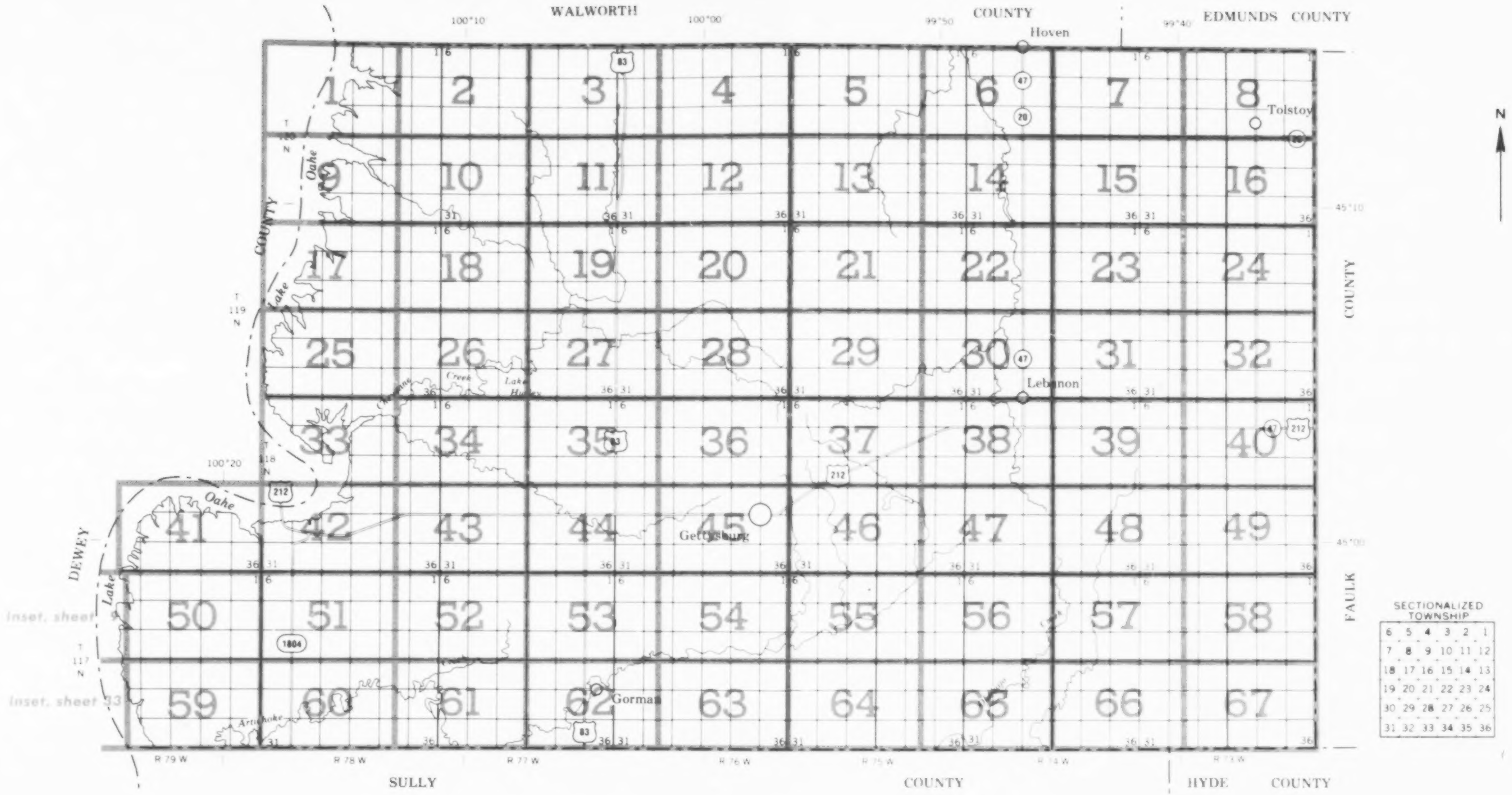
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
POTTER COUNTY, SOUTH DAKOTA

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km



WALWORTH COUNTY
EDMUNDS COUNTY
FAULK COUNTY
HYDE COUNTY
SULLY COUNTY
DEWEY COUNTY
Lake Oahe
Hoven
Tolstoy
Lebanon
Gettysburg
Gorman
Swan Creek
Lake Hiddenwood
Artichoke
100°20
100°10
100°00
99°50
99°40
45°10
45°00
T 120 N
T 119 N
T 118 N
T 117 N
R 79 W
R 78 W
R 77 W
R 76 W
R 75 W
R 74 W
R 73 W
83
212
47
20
1804
Inset, sheet 9
Inset, sheet 33
N
1
2
3
4
5
6
7
8
9
10
11
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51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
SECTIONALIZED TOWNSHIP
6 5 4 3 2 1
7 8 9 10 11 12
18 17 16 15 14 13
19 20 21 22 23 24
30 29 28 27 26 25
31 32 33 34 35 36

INDEX TO MAP SHEETS

POTTER COUNTY, SOUTH DAKOTA

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km

LEGEND

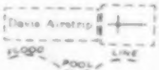
Map symbols consist of a combination of letters. The first capital letter is the initial one of the map unit name. The lowercase letter that follows separates map units having names that begin with the same letter, except that it does not separate sloping phases. The second capital letter indicates the class of slope. Symbols without a slope letter are for nearly level soils of miscellaneous areas.

SYMBOL	NAME
AgA	Agar silt loam, 0 to 2 percent slopes
AgB	Agar silt loam, 2 to 6 percent slopes
AmA	Agar-Mobridge silt loams, 0 to 3 percent slopes
AoA	Agar-Mobridge-Tetonka silt loams, 0 to 3 percent slopes
BgE	Betts-Gettys complex, stony, 15 to 60 percent slopes
BkE	Betts-Java loams, 9 to 25 percent slopes
Bo	Bon loam
Bv	Bon loam, channeled
CaA	Cavo loam, 0 to 2 percent slopes
Da	Davison loam
De	DeGrey silt loam
DmA	Delmont loam, 0 to 2 percent slopes
DsD	Delmont-Schamber complex, 6 to 15 percent slopes
Du	Durrstein silt loam
EaA	Eakin silt loam, 0 to 2 percent slopes
EpB	Eakin-Peno complex, 2 to 6 percent slopes
EpC	Eakin-Peno complex, 6 to 9 percent slopes
GeF	Gettys clay loam, 25 to 40 percent slopes
GlA	Glenham loam, 0 to 2 percent slopes
GpB	Glenham-Plankinton complex, 0 to 4 percent slopes
GrA	Glenham-Prosper loams, 0 to 3 percent slopes
GrB	Glenham-Prosper loams, 1 to 6 percent slopes
HbA	Highmore silt loam, 0 to 2 percent slopes
HbB	Highmore silt loam, 2 to 6 percent slopes
HbC	Highmore silt loam, 6 to 9 percent slopes
HdA	Highmore-DeGrey silt loams, 0 to 2 percent slopes
HfA	Highmore-Mobridge silt loams, 0 to 3 percent slopes
HgB	Highmore-Peno complex, stony, 2 to 6 percent slopes
HgC	Highmore-Peno complex, stony, 6 to 9 percent slopes
Ho	Hoven silt loam
Hu	Hurley silt loam
Hz	Hurley-Slickspots complex
JbC	Java-Betts loams, 6 to 9 percent slopes
JgB	Java-Glenham loams, 2 to 6 percent slopes
JmE	Java-Schamber complex, 9 to 25 percent slopes
Jr	Jerauld silt loam

SYMBOL	NAME
LoA	Lowry silt loam, 0 to 2 percent slopes
LoB	Lowry silt loam, 2 to 6 percent slopes
LoC	Lowry silt loam, 6 to 9 percent slopes
LpC	Lowry-Peno complex, 6 to 9 percent slopes
LpD	Lowry-Peno complex, 9 to 15 percent slopes
Mo	Mobridge silt loam
OaA	Oahe loam, 0 to 2 percent slopes
OaB	Oahe loam, 2 to 6 percent slopes
OdB	Oahe-Delmont loams, 2 to 6 percent slopes
OkF	Okaton silty clay, 15 to 40 percent slopes
OpB	Opal clay, 2 to 6 percent slopes
OpC	Opal clay, 6 to 9 percent slopes
OsD	Opal-Sansarc clays, 9 to 25 percent slopes
Pa	Pits, gravel
Pk	Plankinton silt loam
PrA	Promise clay, 0 to 2 percent slopes
PrB	Promise clay, 2 to 6 percent slopes
RaA	Raber loam, 0 to 2 percent slopes
RaB	Raber loam, 2 to 6 percent slopes
RcA	Raber-Cavo loams, 0 to 2 percent slopes
RcB	Raber-Cavo loams, 2 to 6 percent slopes
RgD	Raber-Gettys complex, 9 to 25 percent slopes
RhC	Raber-Peno loams, 6 to 9 percent slopes
Rn	Ranslo silt loam
Rr	Ranslo-Durrstein silt loams
RsA	Ree loam, 0 to 2 percent slopes
Rt	Regan silt loam
SaF	Sansarc clay, 15 to 40 percent slopes
ScF	Schamber gravelly loam, 15 to 60 percent slopes
Te	Tetonka silt loam
Wa	Walke silt loam
Wf	Wendte silty clay loam, channeled
Wo	Worthing silty clay loam
Wp	Worthing silty clay loam, ponded

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES	
County or parish	—— –
Limit of soil survey (label)	——
Field sheet matchline & neatline	——
AD HOC BOUNDARY (label)	
Small airport, airfield, park, oilfield, cemetery, or flood pool	
STATE COORDINATE TICK	─┴─
LAND DIVISION CORNERS (sections and land grants)	└ ┴ ┼ ┼
ROADS	
Other roads	——
ROAD EMBLEMS & DESIGNATIONS	
Federal	410
State	(52)
RAILROAD	─┼─┼─
DAMS	
Medium or small	
PITS	
Gravel pit (< 3 acres)	⚒
MISCELLANEOUS CULTURAL FEATURES	
Farmstead, house	•
Church	i
School	i

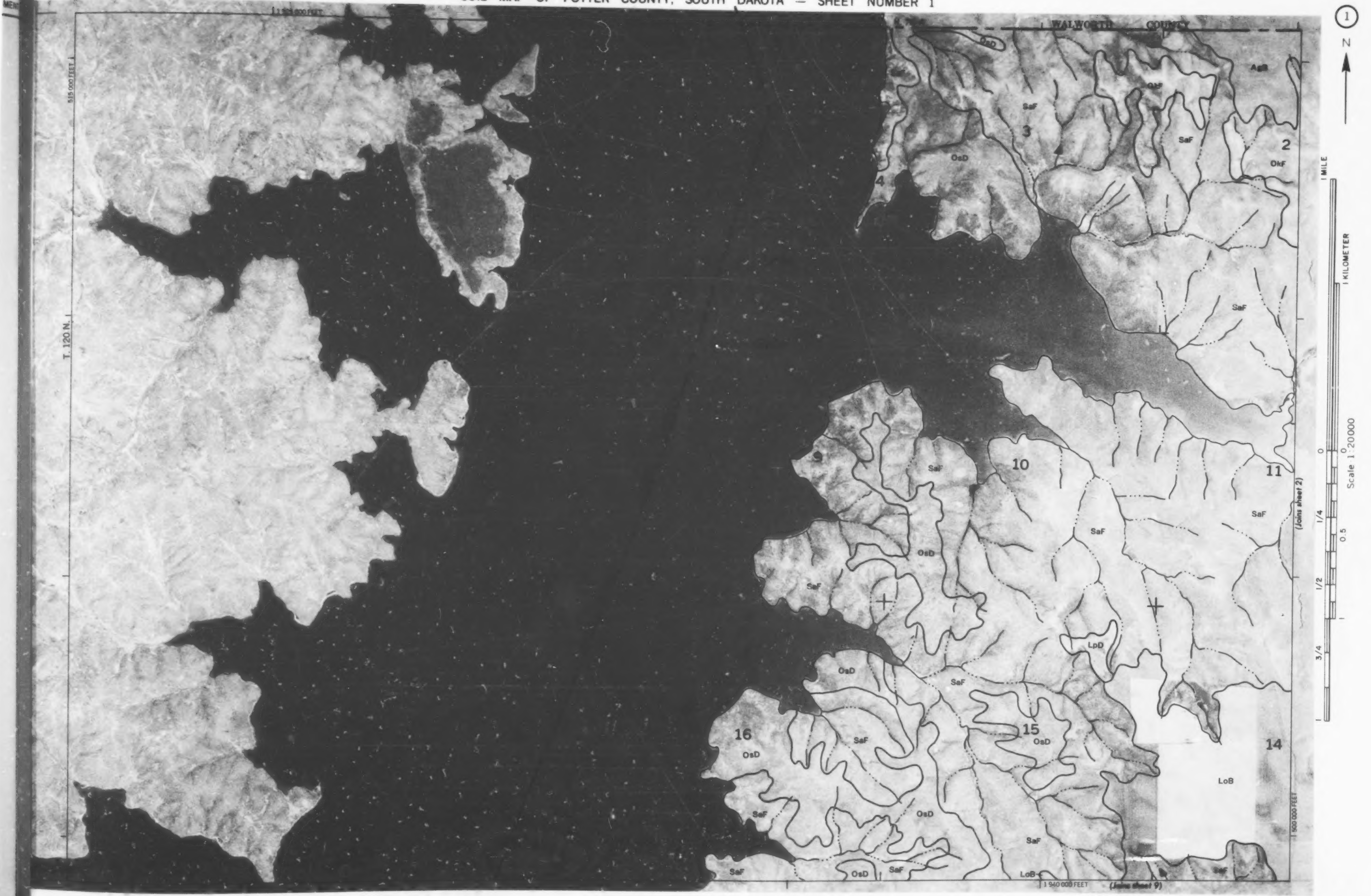
WATER FEATURES

DRAINAGE	
Intermittent	⌒
Drainage end	↘
MISCELLANEOUS WATER FEATURES	
Wet spot (< 5 acres)	ψ

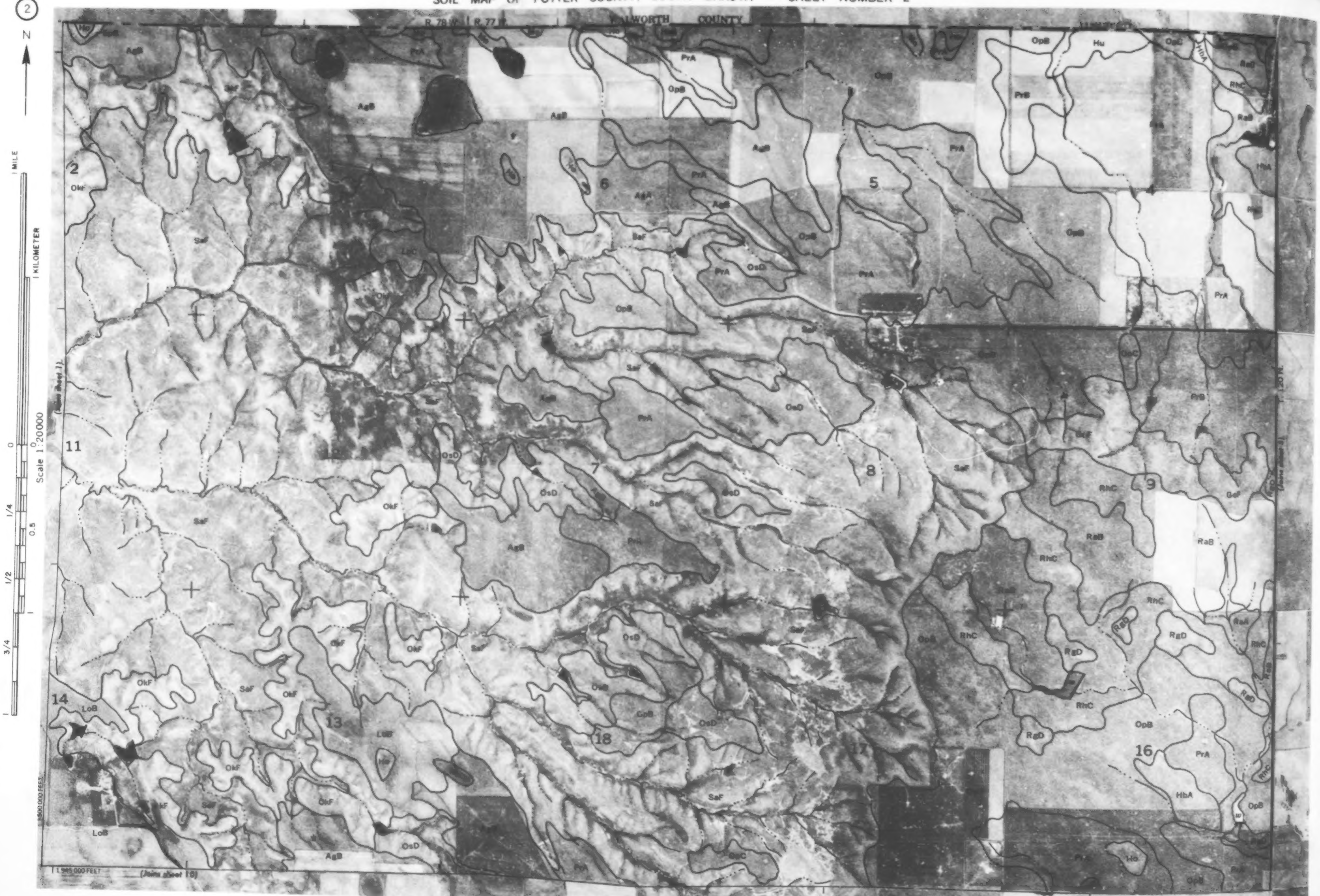
SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS	Bv RdB
MISCELLANEOUS	
Dumps and other similar non soil areas	≡

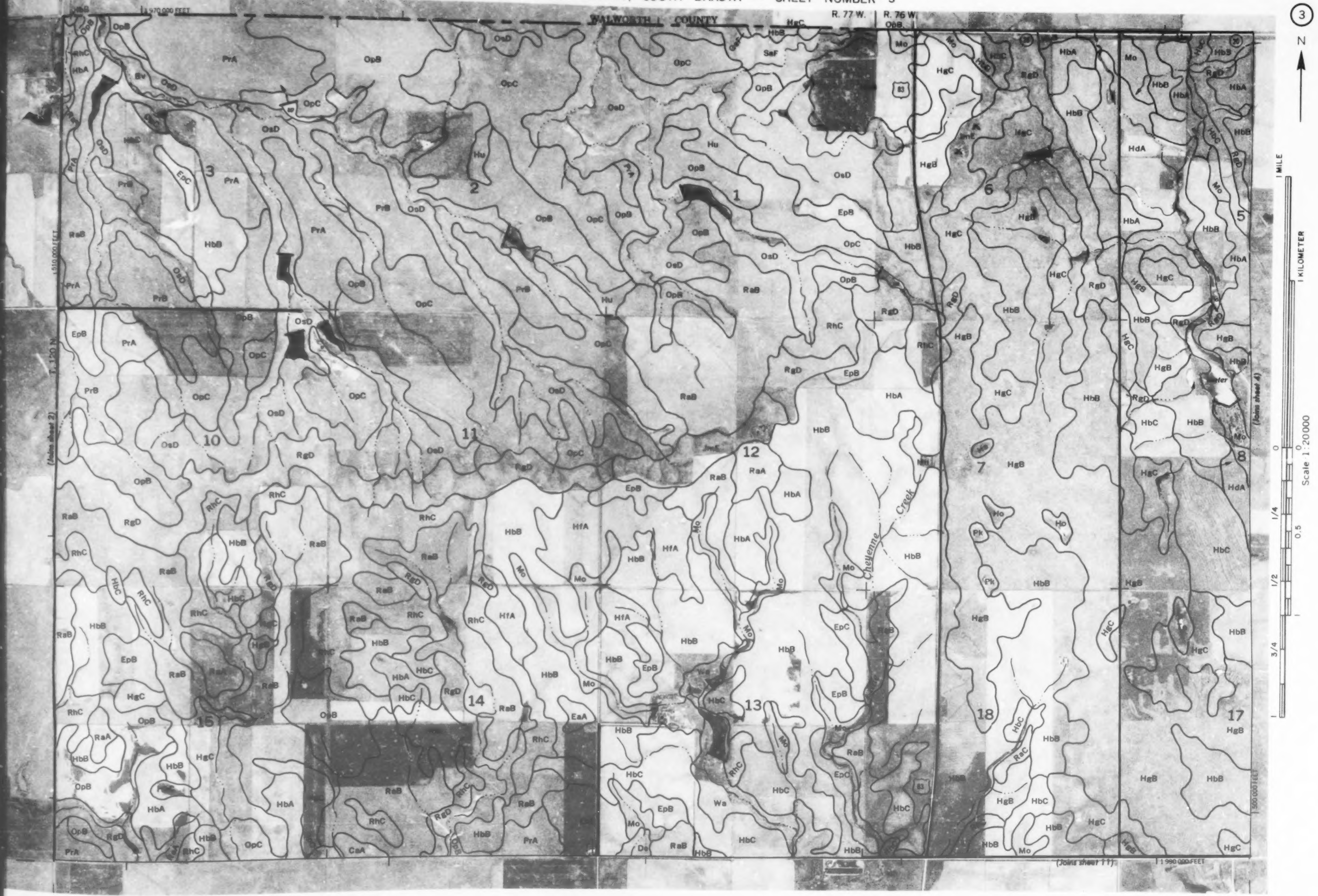
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 1


①
N
WALWORTH COUNTY
1 920 000 FEET
515 000 FEET
T. 120 N.
OsD
SaF
AgB
OkF
3
2
4
SaF
OsD
OkF
SaF
10
11
SaF
SaF
OsD
SaF
LpD
SaF
OsD
15
OsD
16
OsD
SaF
14
LoB
SaF
OsD
SaF
SaF
OsD
SaF
LoB
SaF
500 000 FEET
1 940 000 FEET
(Joins sheet 9)
(Joins sheet 2)
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
1
0
0.5
1
Scale 1:20000

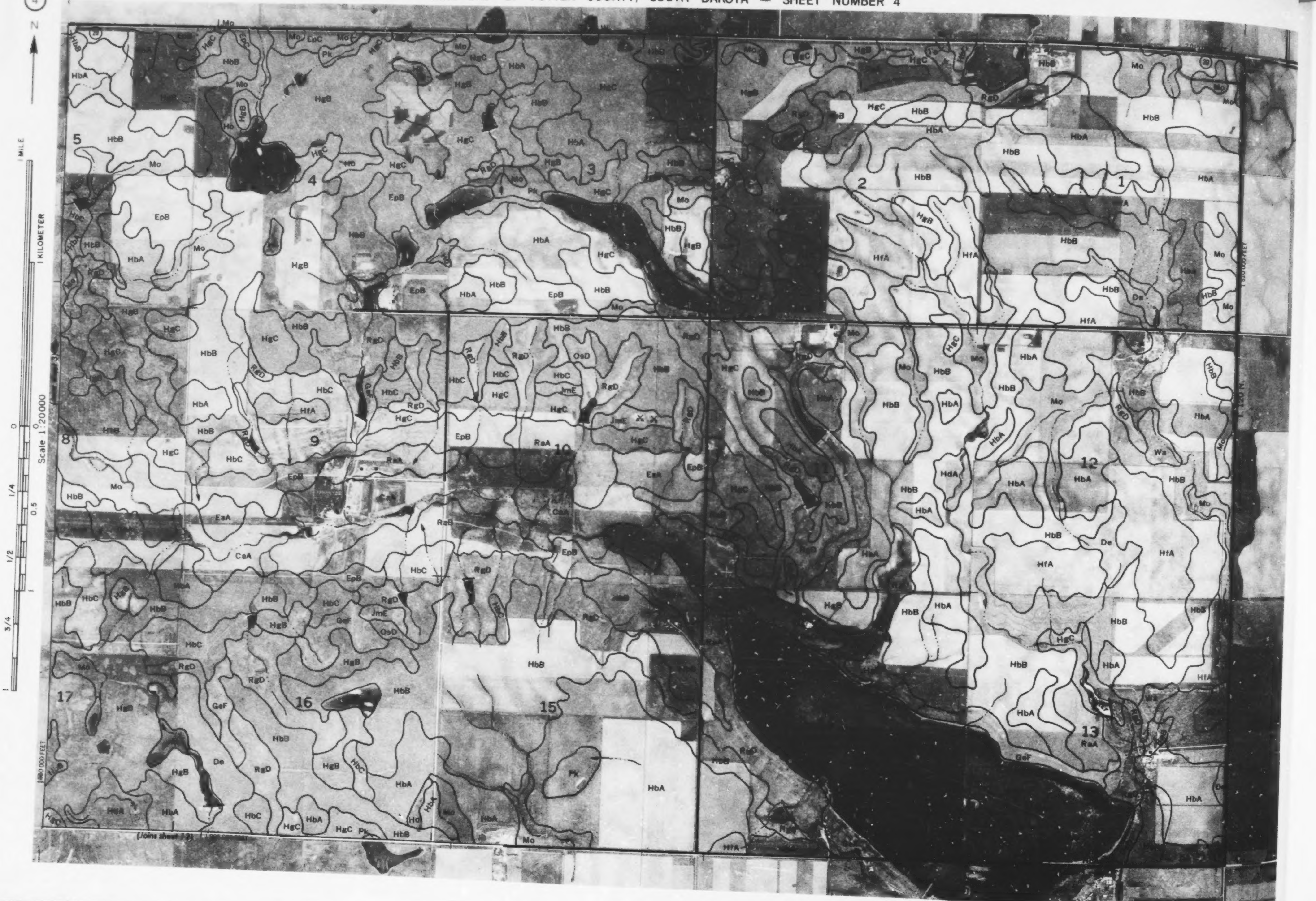
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 2


②
N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
R. 78 W.
R. 77 W.
WALWORTH COUNTY
(Joins sheet 1)
(Joins sheet 10)
(Joins sheet 3)
1 940 000 FEET
1 946 000 FEET
120 N
2
5
6
7
8
9
11
13
14
16
17
18
AgA
AgB
GeF
HbA
Ho
Hu
LoB
OkF
OpB
OpC
OsD
PrA
PrB
RaA
RaB
RgD
RhC
SaF

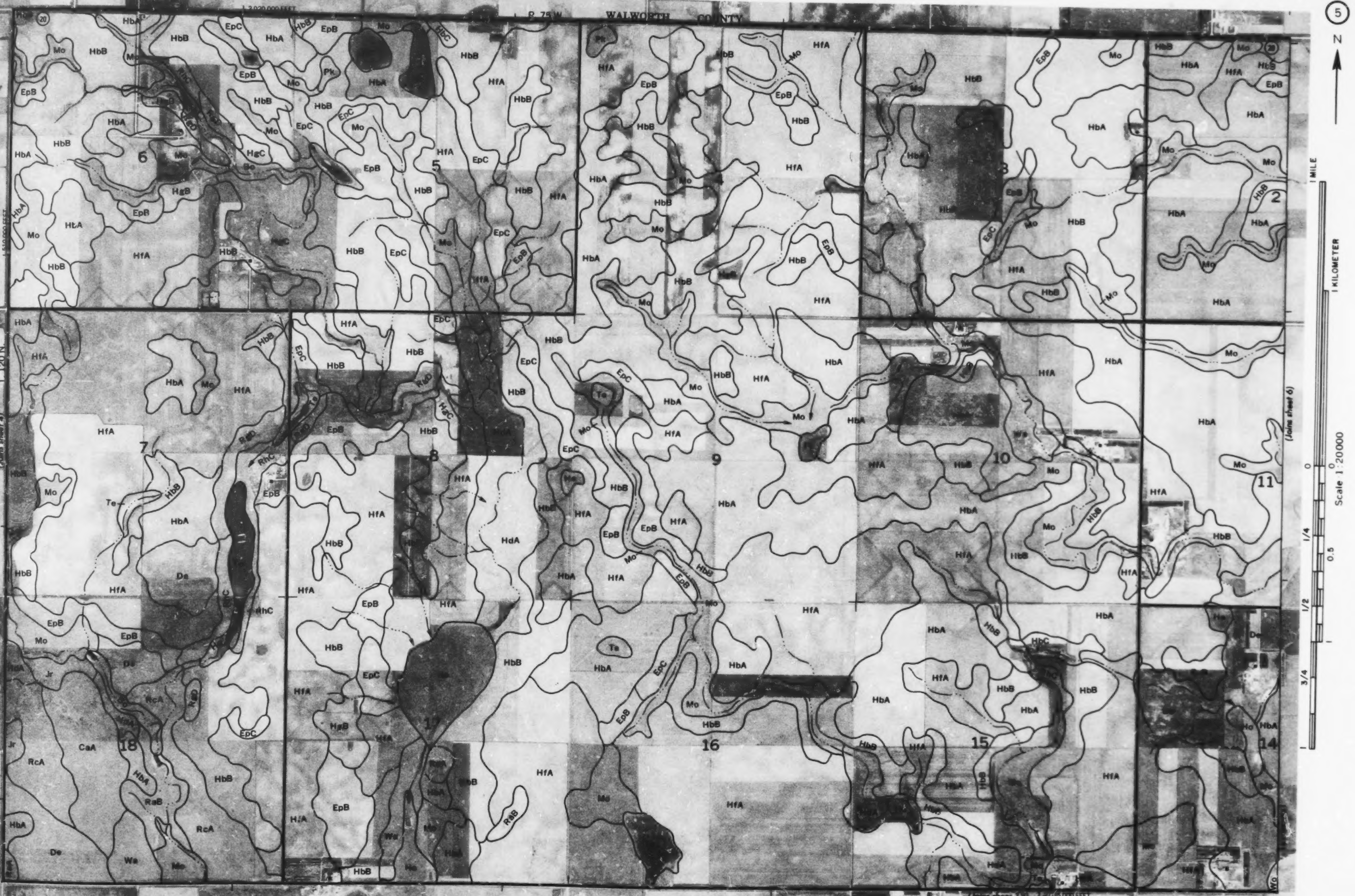
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 3


③
N
WALWORTH COUNTY
R. 77 W.
R. 76 W.
T. 120 N.
1 970 000 FEET
1 990 000 FEET
510 000 FEET
500 000 FEET
(Joins sheet 2)
(Joins sheet 4)
(Joins sheet 11)
Cheyenne Creek
83
1 MILE
1 KILOMETER
Scale 1:20 000
0
1/4
1/2
3/4
1
0
0.5
1
1
2
3
4
5
6
7
8
10
11
12
13
14
15
17
18

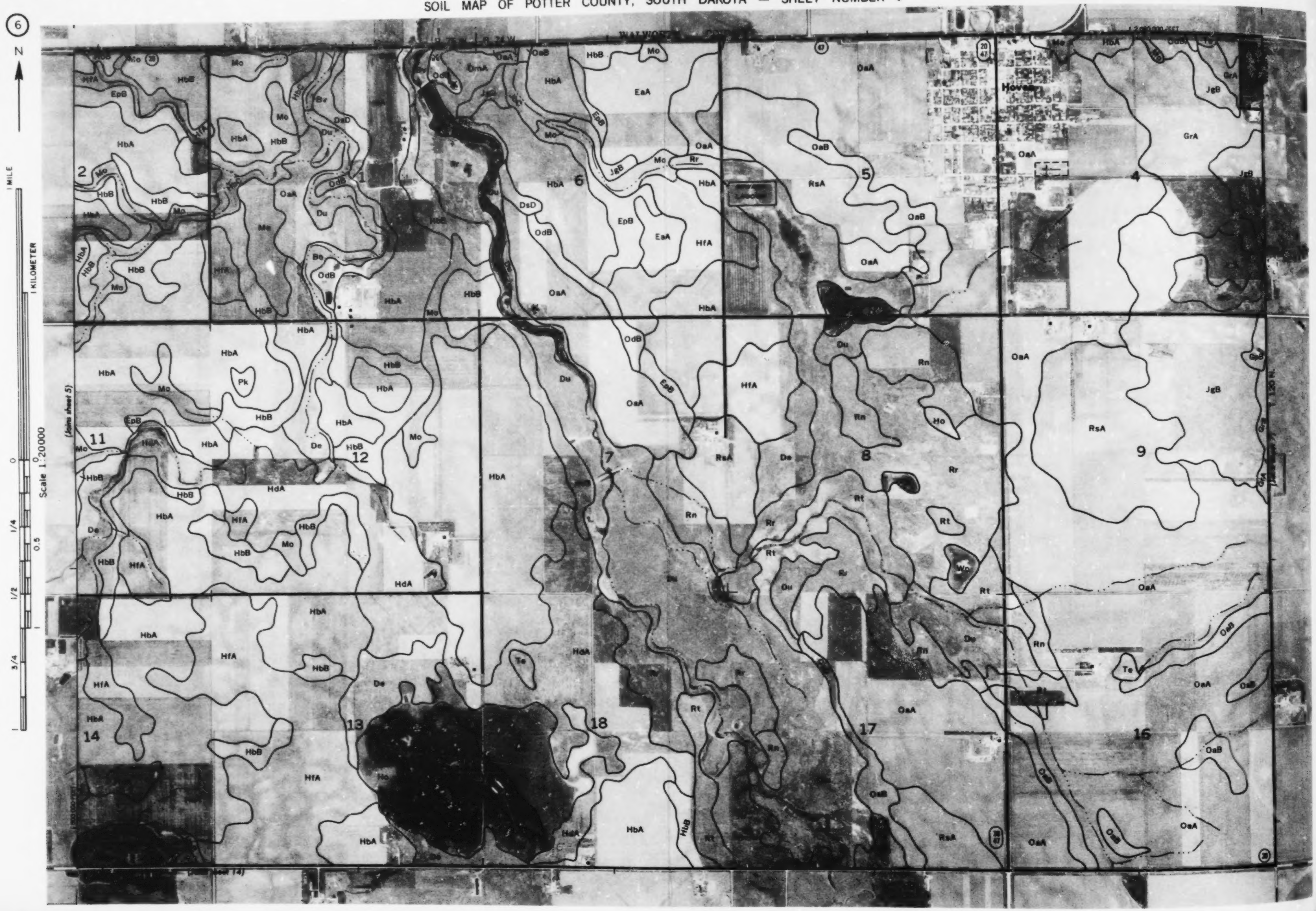
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 4


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
0
0.5
1
1
2
3
4
5
8
9
10
12
13
15
16
17
(Joins sheet 8)
HbA
HbB
HbC
HgB
HgC
HfA
Mo
EpB
EpC
RgD
RaA
RaB
CaA
EaA
GeF
JmE
OsD
Pk
De
Wa
1 120 N.

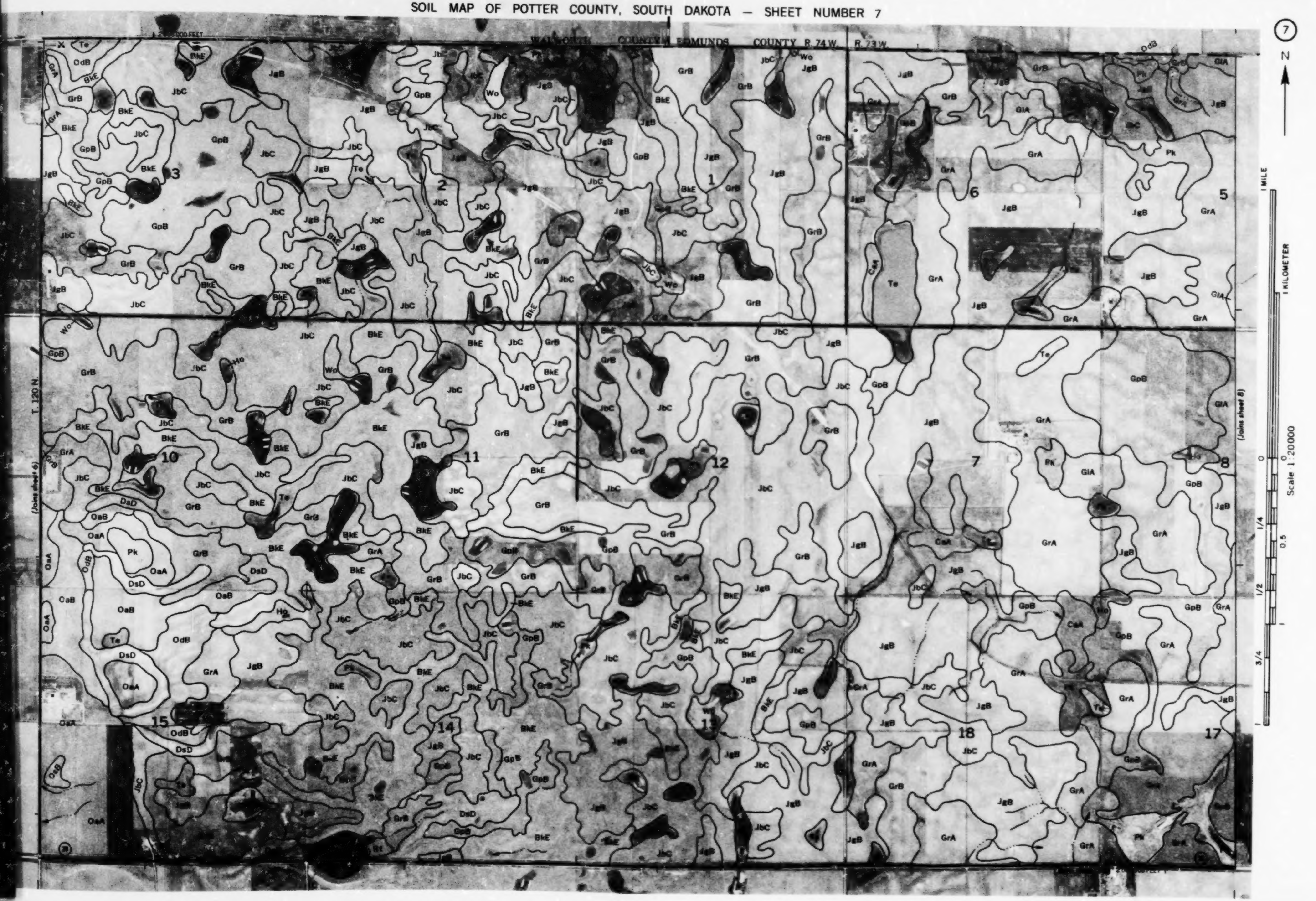
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 5


⑤
N
R. 75 W.
WALWORTH COUNTY
T. 120 N.
(Joins sheet 4)
(Joins sheet 6)
(Joins sheet 13)
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0.5
1
2
3
4
5
6
7
8
9
10
11
14
15
16
17
18

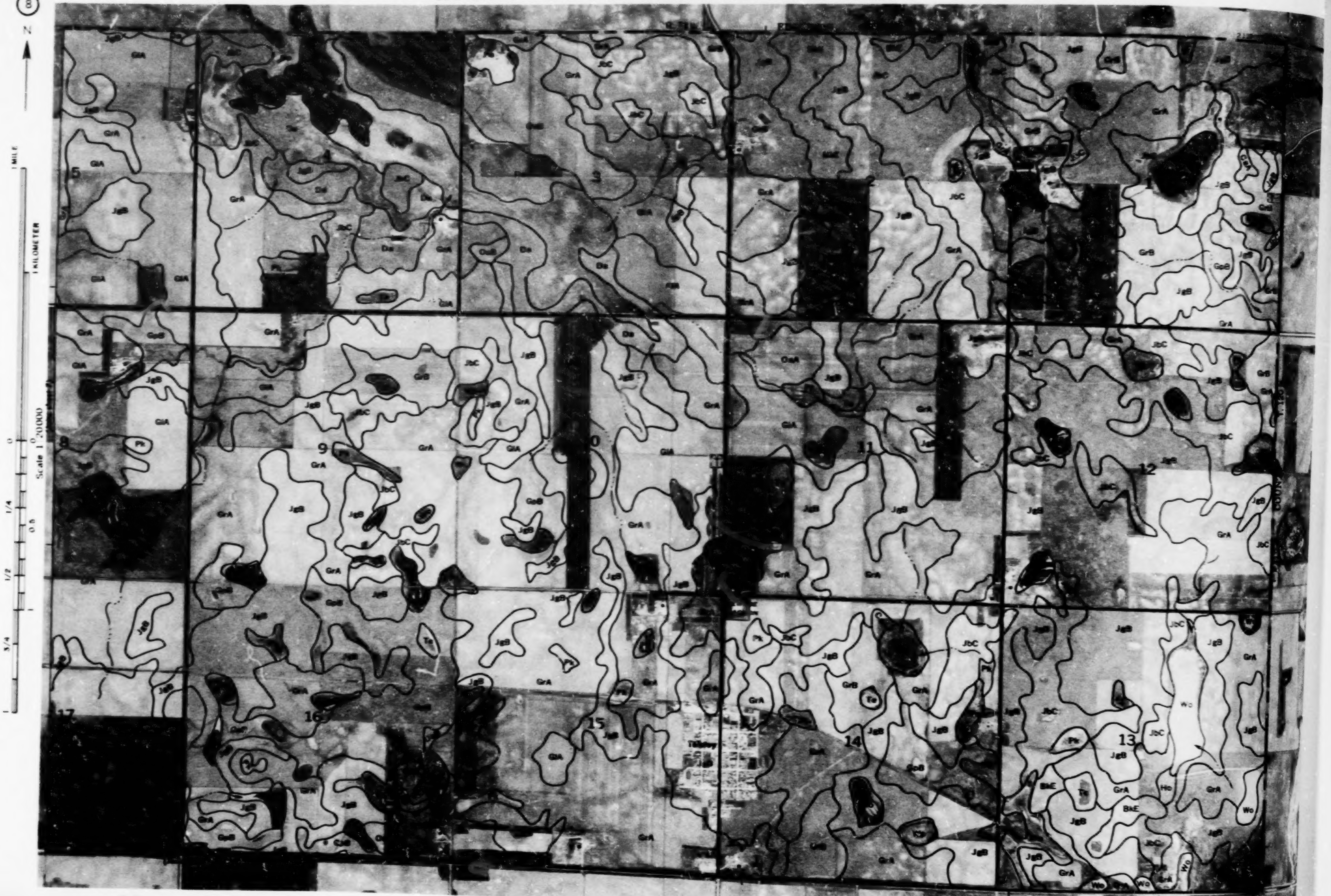
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 6


6
N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
0.5
1/2
3/4
1
(Joins sheet 5)
(Joins sheet 14)
WALWORTH
Hoven
1
2
4
5
6
7
8
9
11
12
13
14
16
17
18
HbA
HbB
HfA
HdA
EpB
EaA
Mo
Du
De
OaA
OaB
OdB
DsD
Pk
Rn
Rr
Rt
RsA
JgB
GrA
Ho
Te
Wo
Bv
DuD

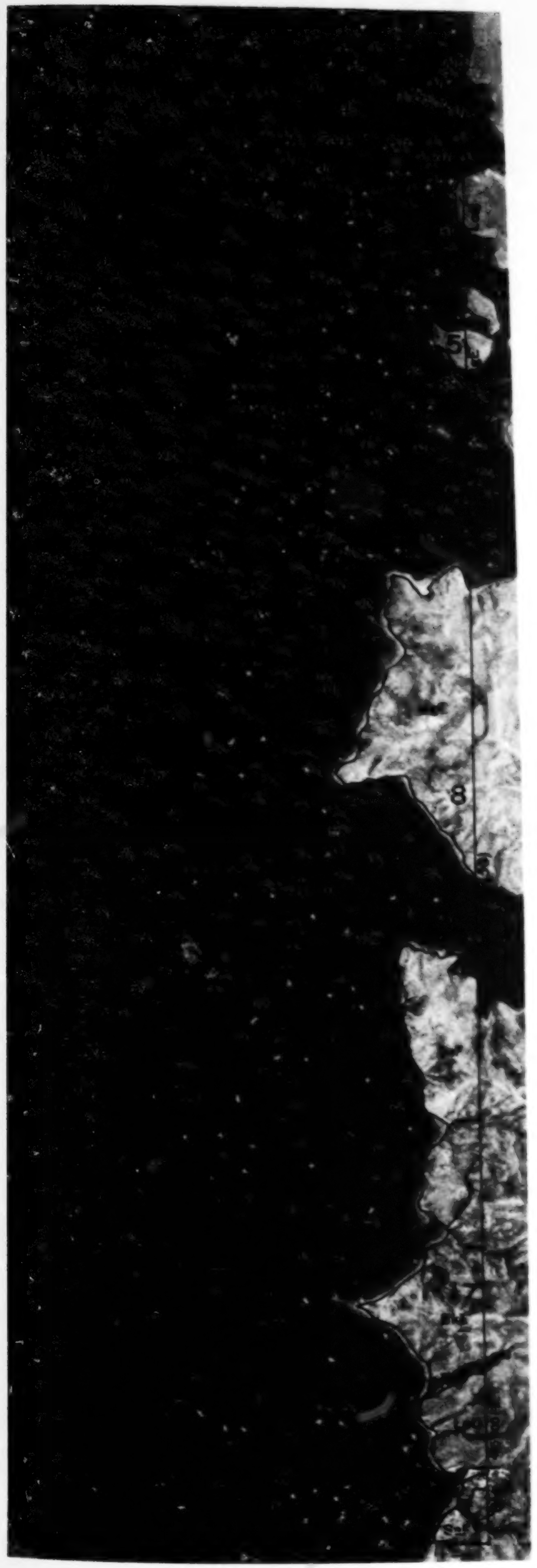
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 7


7
N
WALWORTH COUNTY
EDMUNDS COUNTY
R.74 W.
R.73 W.
T.120 N.
(Joins sheet 6)
(Joins sheet 8)
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0.5
1
2
3
5
6
7
8
10
11
12
13
14
15
17
18

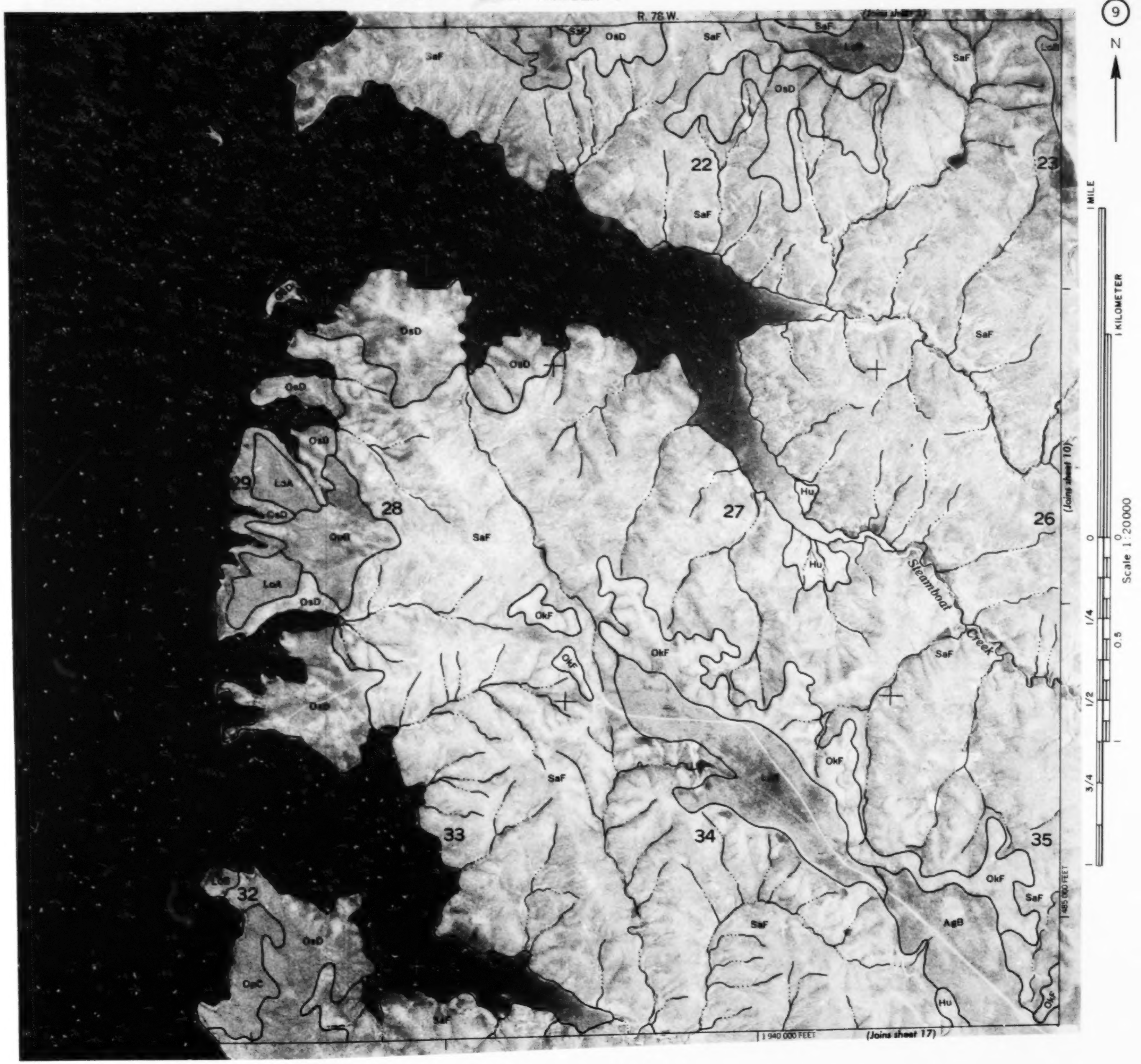
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 8


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0.5
1
2
3
4
5
8
9
10
11
12
13
14
15
16
17
Tolstoy
GrA
GrB
JgB
JbC
GlA
GoB
De
Pk
Te
Wo
Ho
BkE

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 9

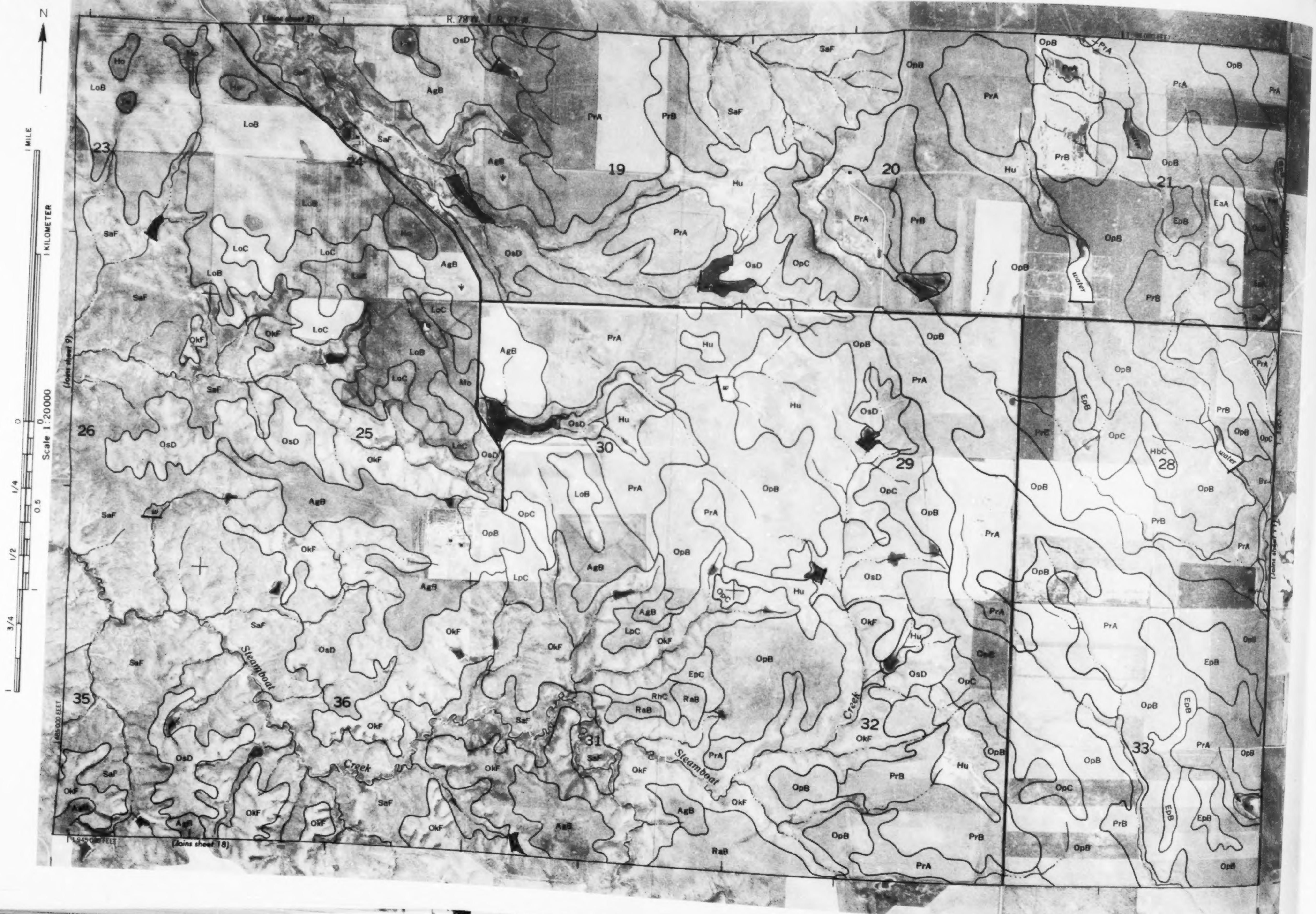


3000 AND 5000-FOOT GRID TICKS

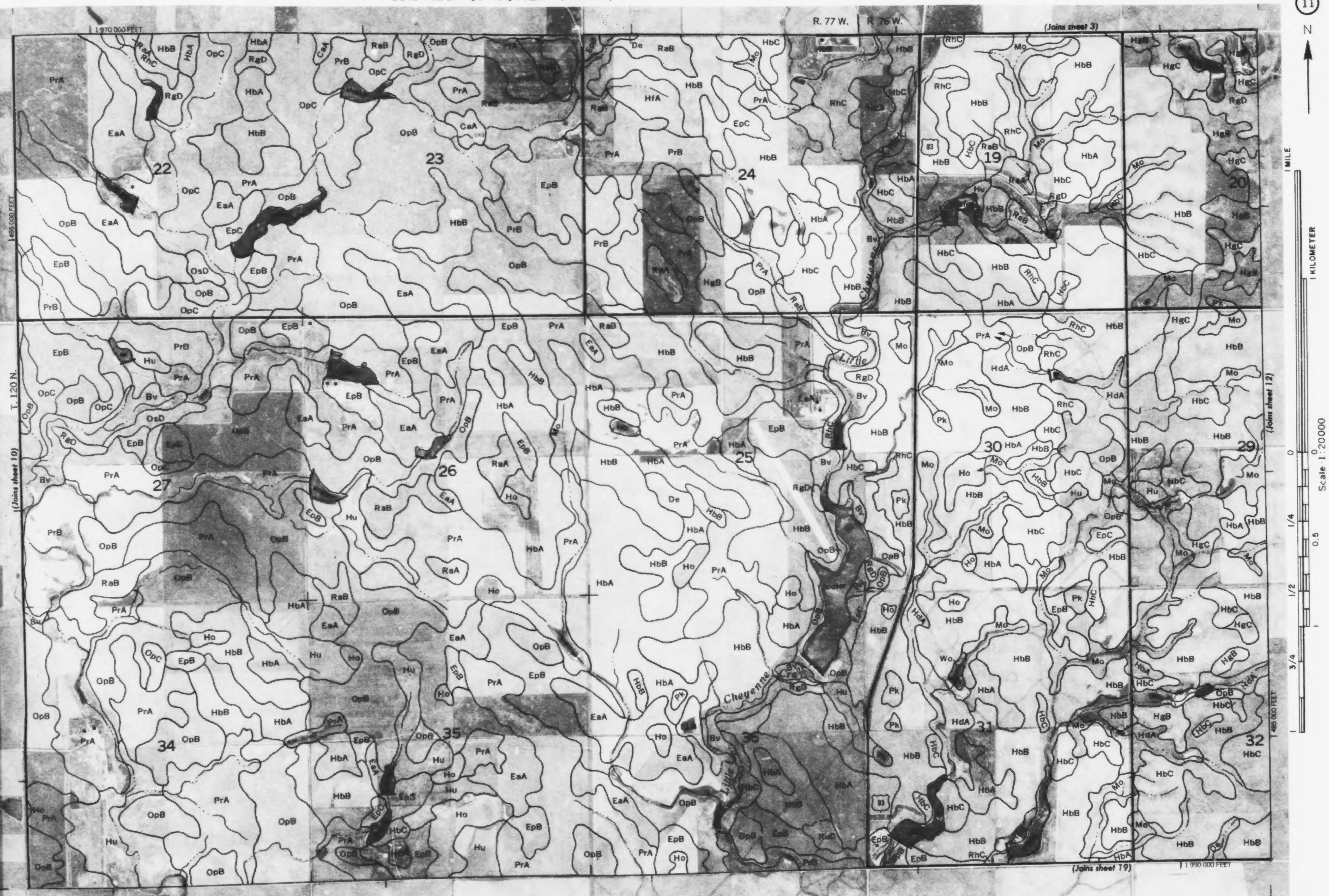

R. 78 W.
(Joins sheet 3)
(Joins sheet 10)
(Joins sheet 17)
1 940 000 FEET
485 000 FEET
22
23
26
27
28
29
32
33
34
35
SaF
OsD
LoB
LoA
OpB
OpC
OkF
Hu
AgB
Steamboat Creek
9
N
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
0.5
Scale 1:20000

⑩

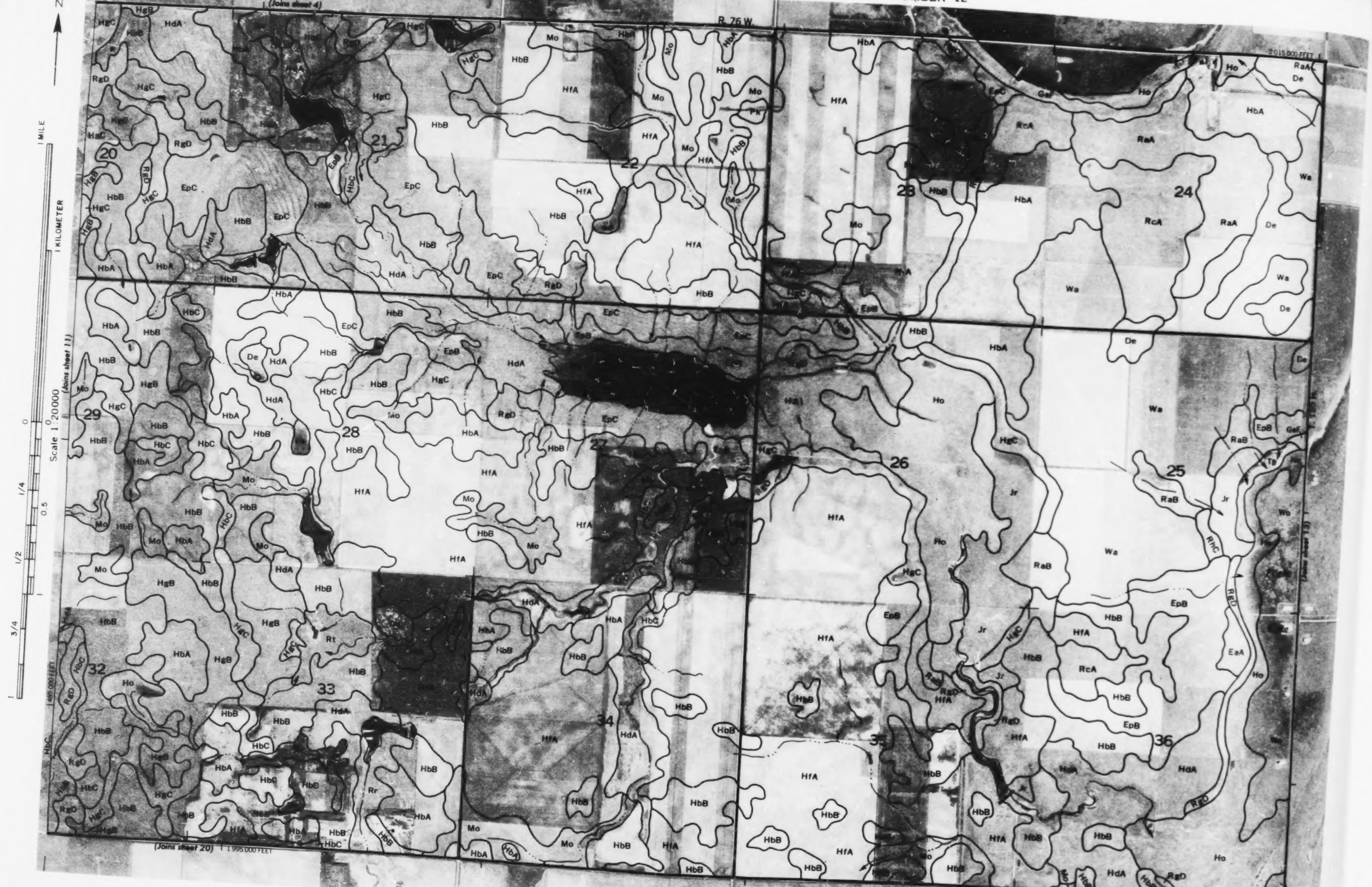
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 10


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
0
0.5
1
(Joins sheet 2)
R. 79 W.
R. 77 W.
(Joins sheet 9)
(Joins sheet 11)
(Joins sheet 18)
1 845 000 FEET
19
20
21
23
24
25
26
28
29
30
31
32
33
35
36
Steamboat
Creek
Steamboat
Creek
water
water
water
LoB
LoC
Mo
SaF
AgB
OsD
PrA
PrB
OpB
OpC
Hu
EaA
EpB
EpC
OkF
LpC
HbC
RaB
RhC
Bv

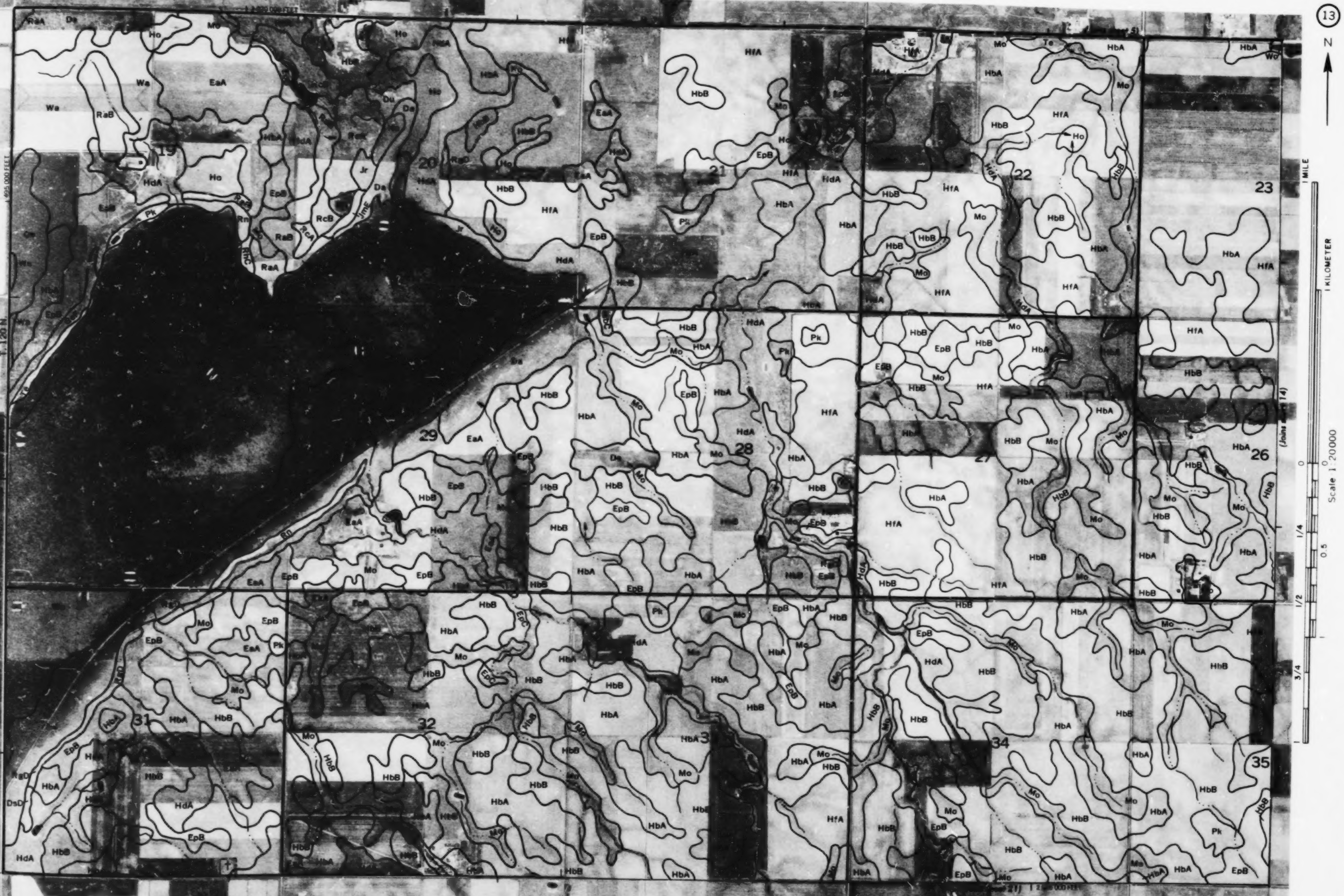
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 11


11
N
R. 77 W.
R. 76 W.
(Joins sheet 3)
(Joins sheet 10)
(Joins sheet 12)
(Joins sheet 19)
T. 120 N.
1 970 000 FEET
495 000 FEET
1 990 000 FEET
485 000 FEET
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
0.5
Scale 1:20000
19
20
22
23
24
25
26
27
29
30
31
32
34
35
36
Little Cheyenne
Cheyenne
83

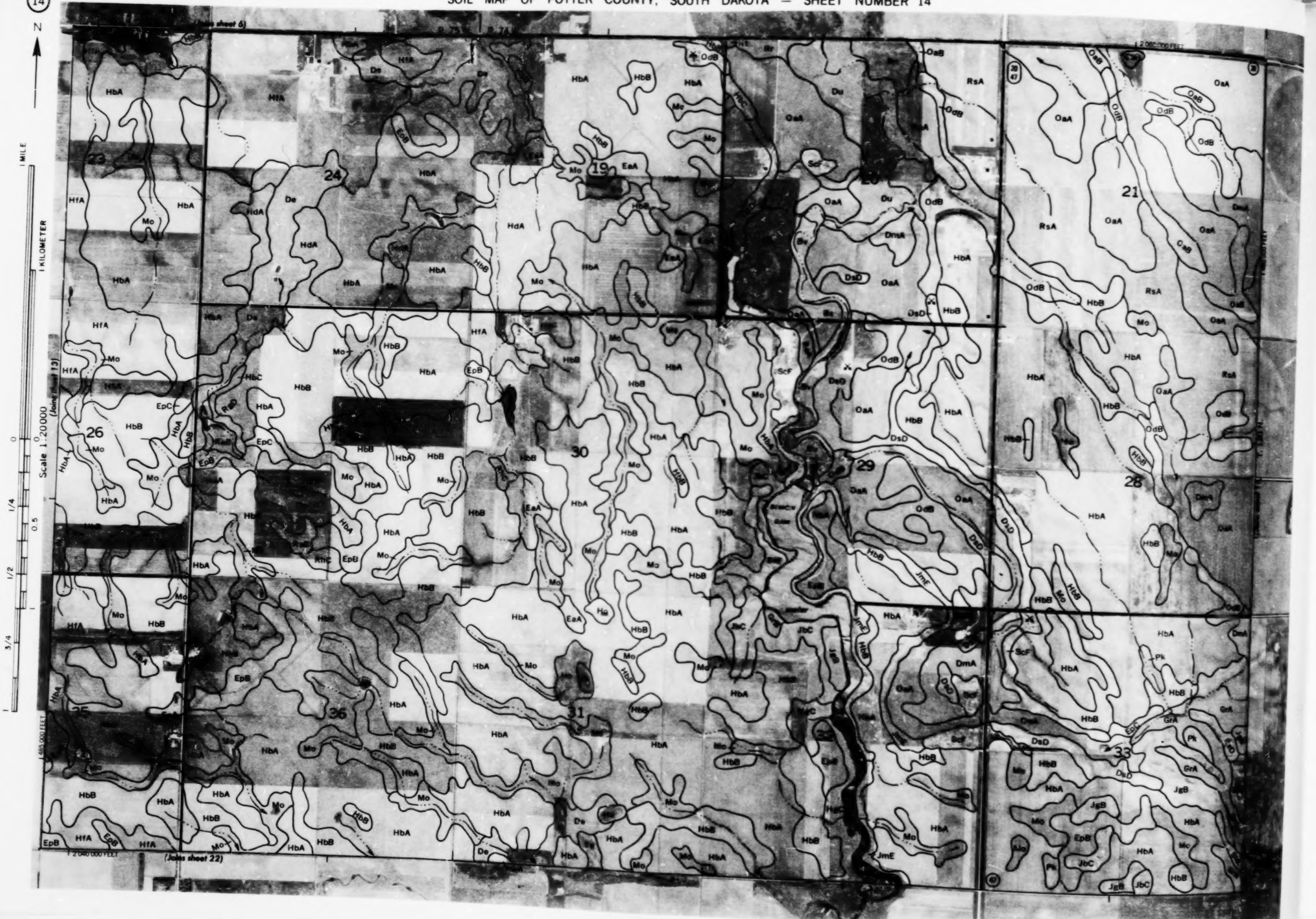
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 12


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
0.5
1/2
3/4
1
(Joins sheet 4)
R. 76 W.
2 015 000 FEET
(Joins sheet 11)
(Joins sheet 13)
(Joins sheet 20)
1 995 000 FEET
485 000 FEET
20
21
22
23
24
25
26
27
28
29
32
33
34
35
36
HgB
HgC
HdA
HbA
HbB
HbC
HfA
RgD
EpB
EpC
Mo
Pk
Ho
RaA
RaB
RcA
De
Wa
GeF
Jr
RhC
Tp
EaA
Rt
Rr

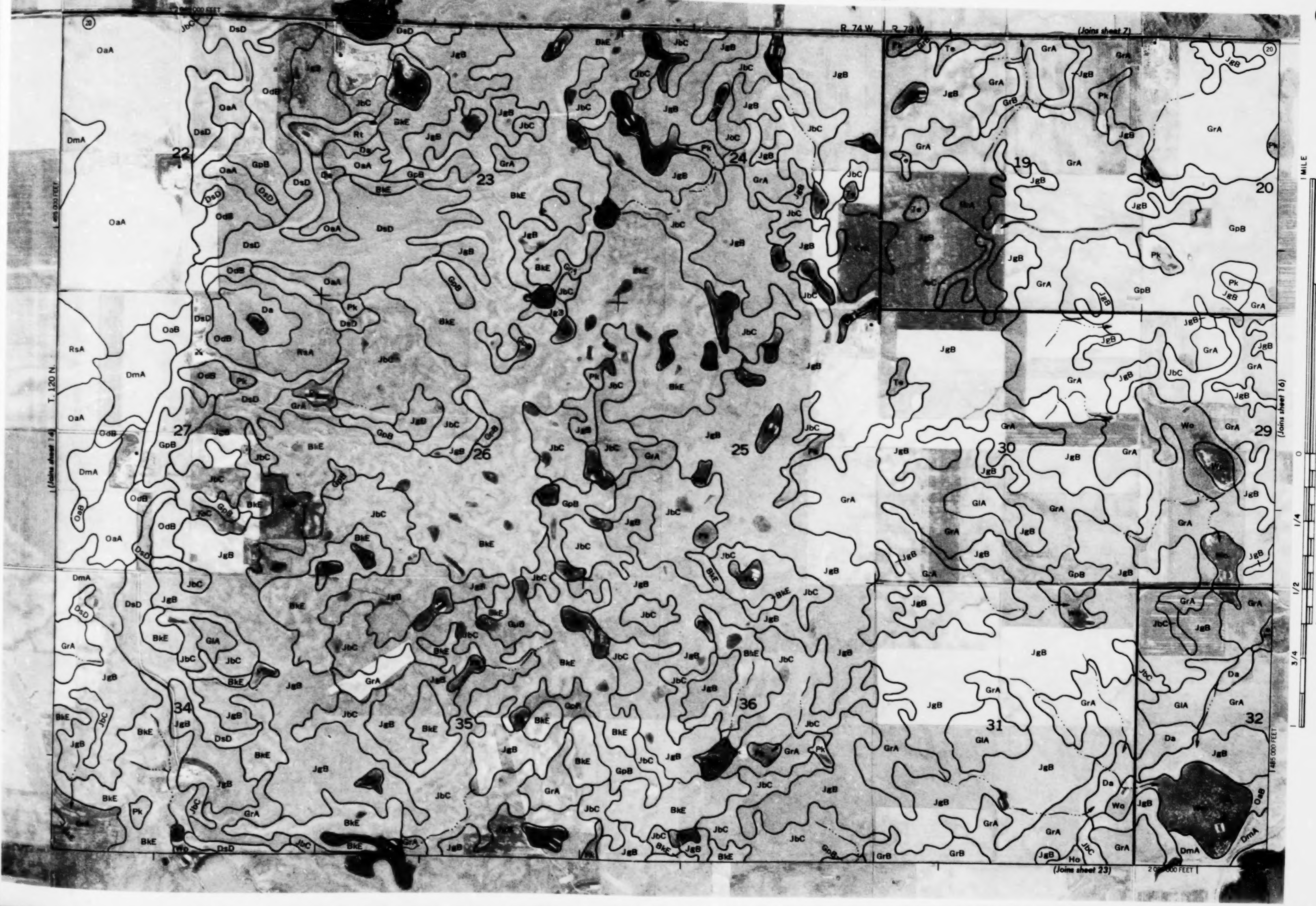
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 13


13
N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
T. 120 N.
(Joins sheet 14)
19
20
21
22
23
26
27
28
29
31
32
33
34
35
RaA
Da
Mo
Ho
Wa
EaA
RaB
HdA
HbB
HbA
HfA
EpB
Pk
Jr
RcB
RcA
Rn
ImE
Ps
Te
Wo
EpC
RsD
DsD

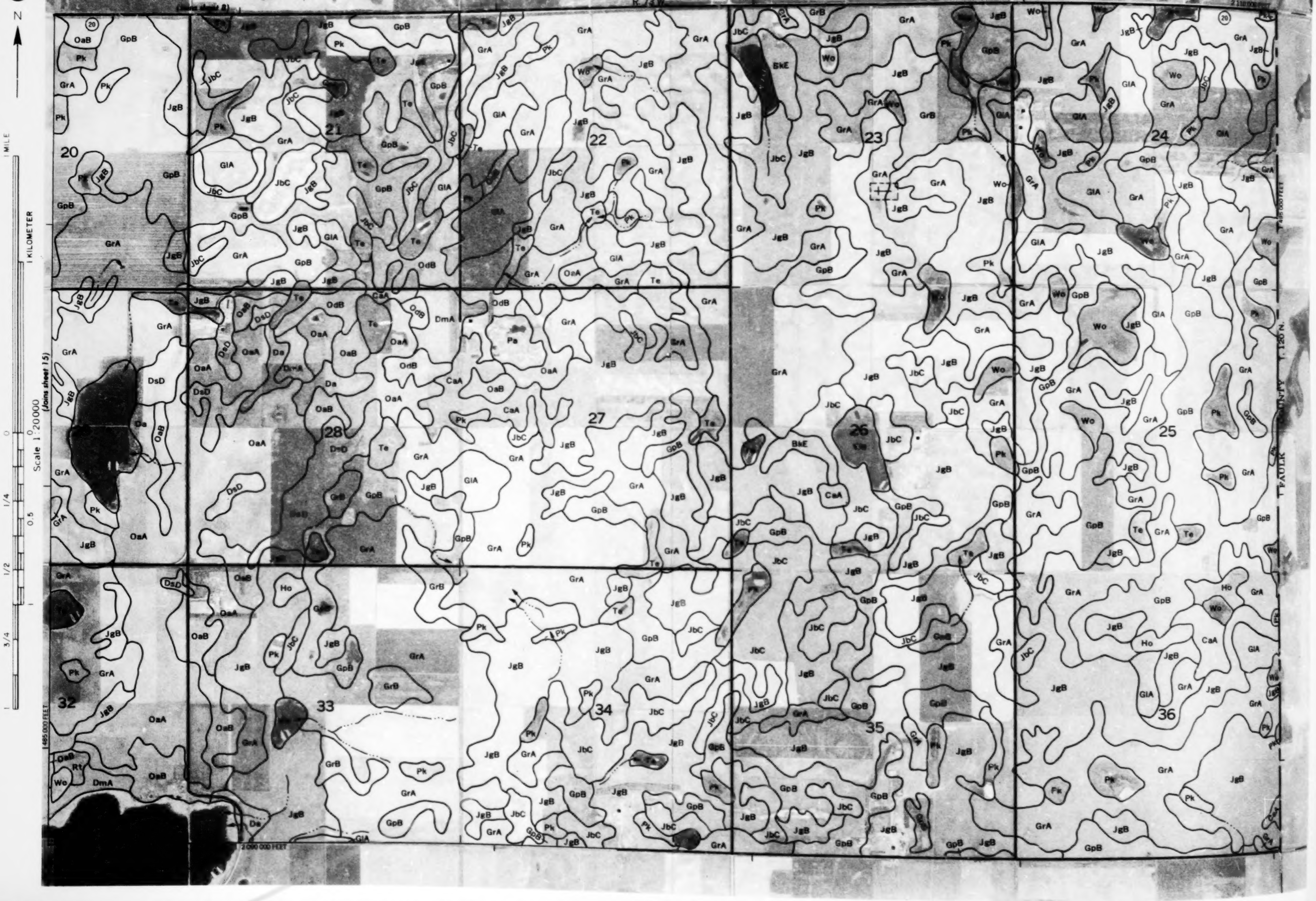
⑭ SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 14


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
(Joins sheet 6)
(Joins sheet 13)
(Joins sheet 22)
2 040 000 FEET
2 060 000 FEET
485 000 FEET
19
20
21
23
24
25
26
28
29
30
31
33
35
36
HbA
HbB
HbC
HdA
HfA
Mo
De
Du
EaA
EpB
EpC
OaA
OaB
OdB
RsA
ScF
DmA
DsD
JmE
JbC
JgB
GrA
Pk
Br

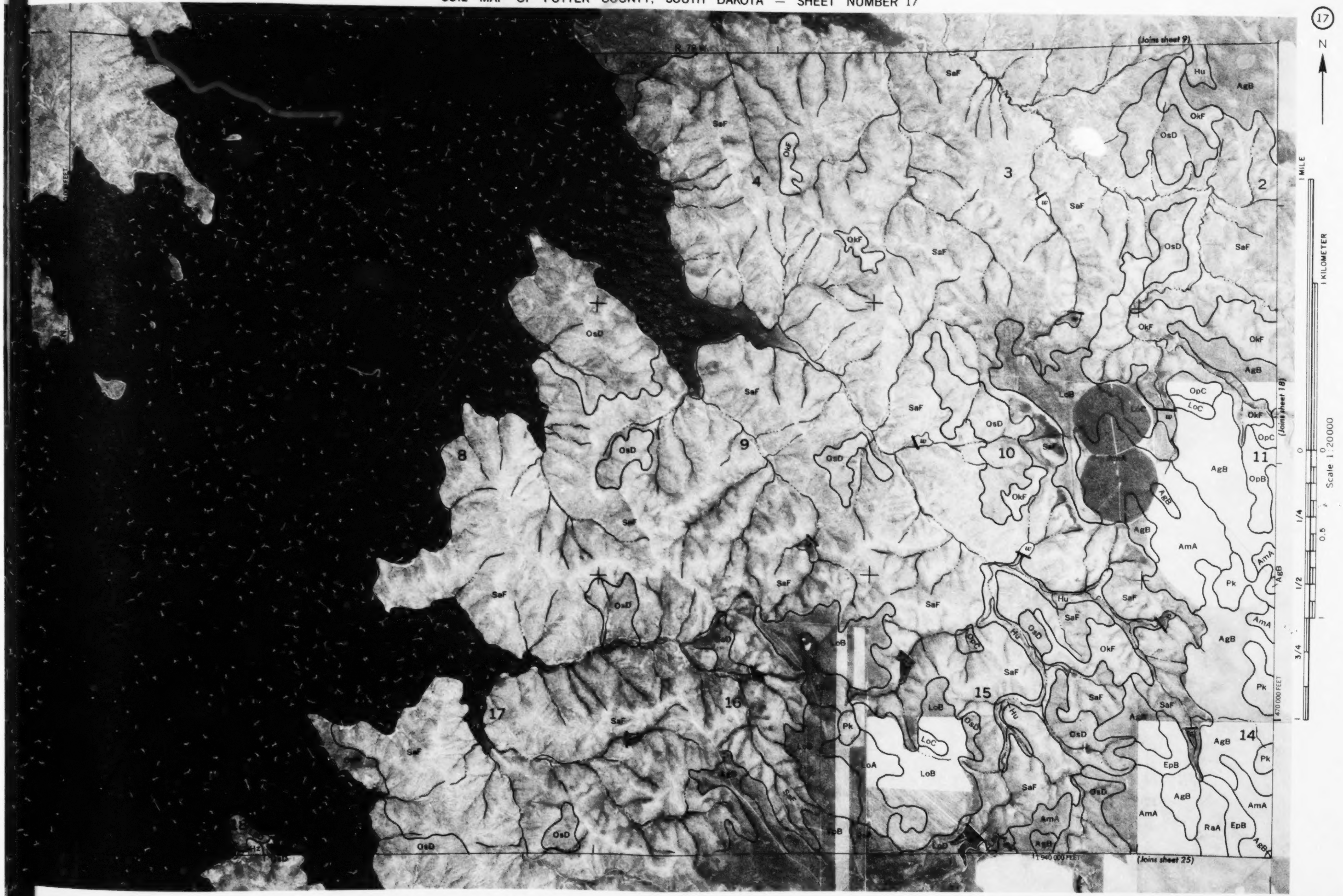
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 15


(Joins sheet 7)
R. 74 W. | R. 73 W.
T. 120 N.
(Joins sheet 14)
(Joins sheet 16)
(Joins sheet 23)
485 000 FEET
2 000 000 FEET
19
20
22
23
24
25
26
27
29
30
31
32
34
35
36
1 MILE
0
1/4
1/2
3/4
OaA
DsD
OdB
DmA
RsA
JbC
BkE
JgB
GrA
GpB
GlA
Pk
Te
Da
Wo
Ho
GrB

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 16

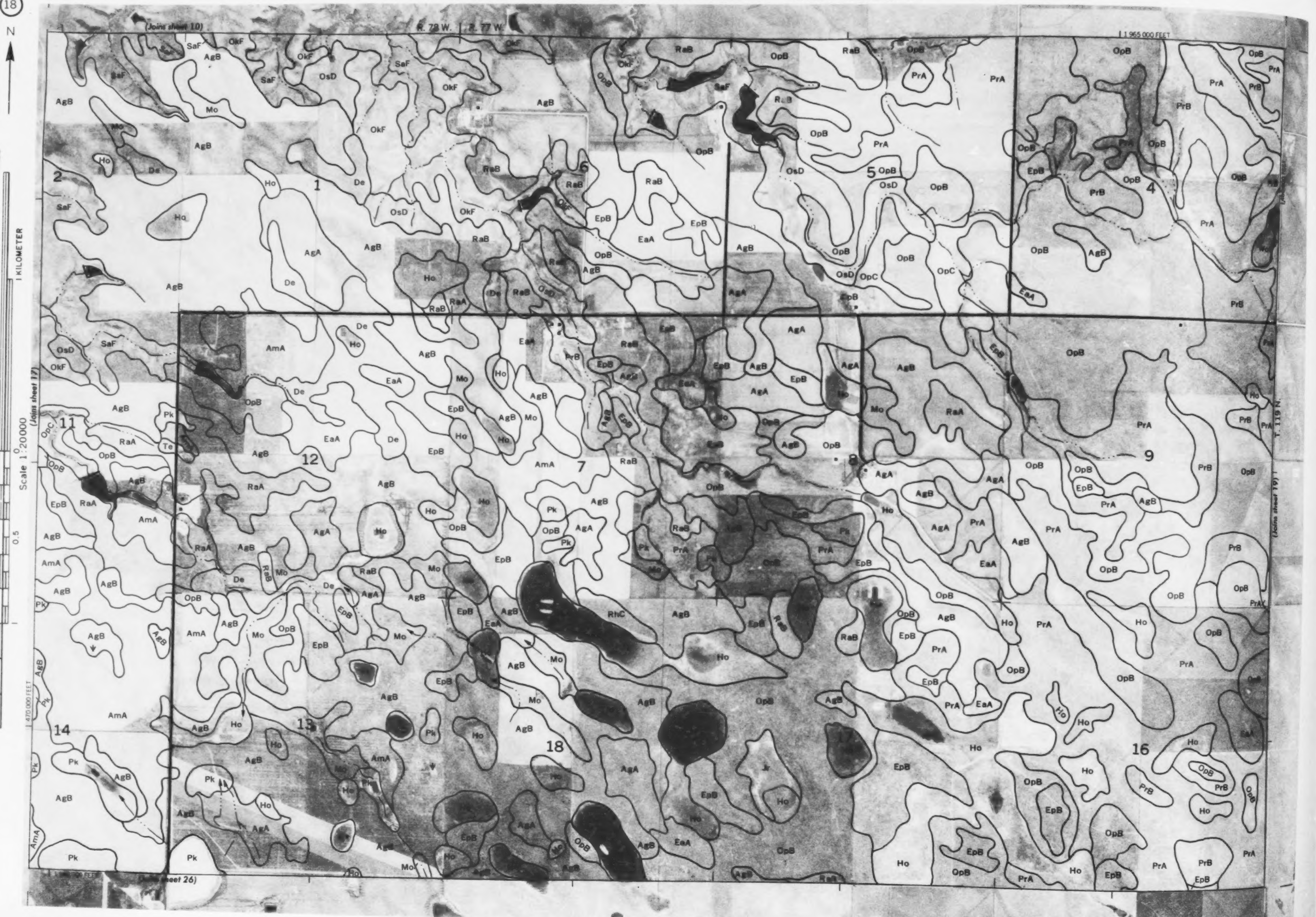

N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
(Joins sheet 8)
(Joins sheet 15)
R. 73 W.
T. 120 N.
FAULK COUNTY
20
2 110 000 FEET
485 000 FEET
2 090 000 FEET
20
21
22
23
24
25
26
27
28
29
32
33
34
35
36
GrA
GpB
JgB
JbC
GlA
Pk
Te
Wo
OaA
OaB
OdB
DsD
Da
DmA
CaA
BkE
Ho
Rt

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 17

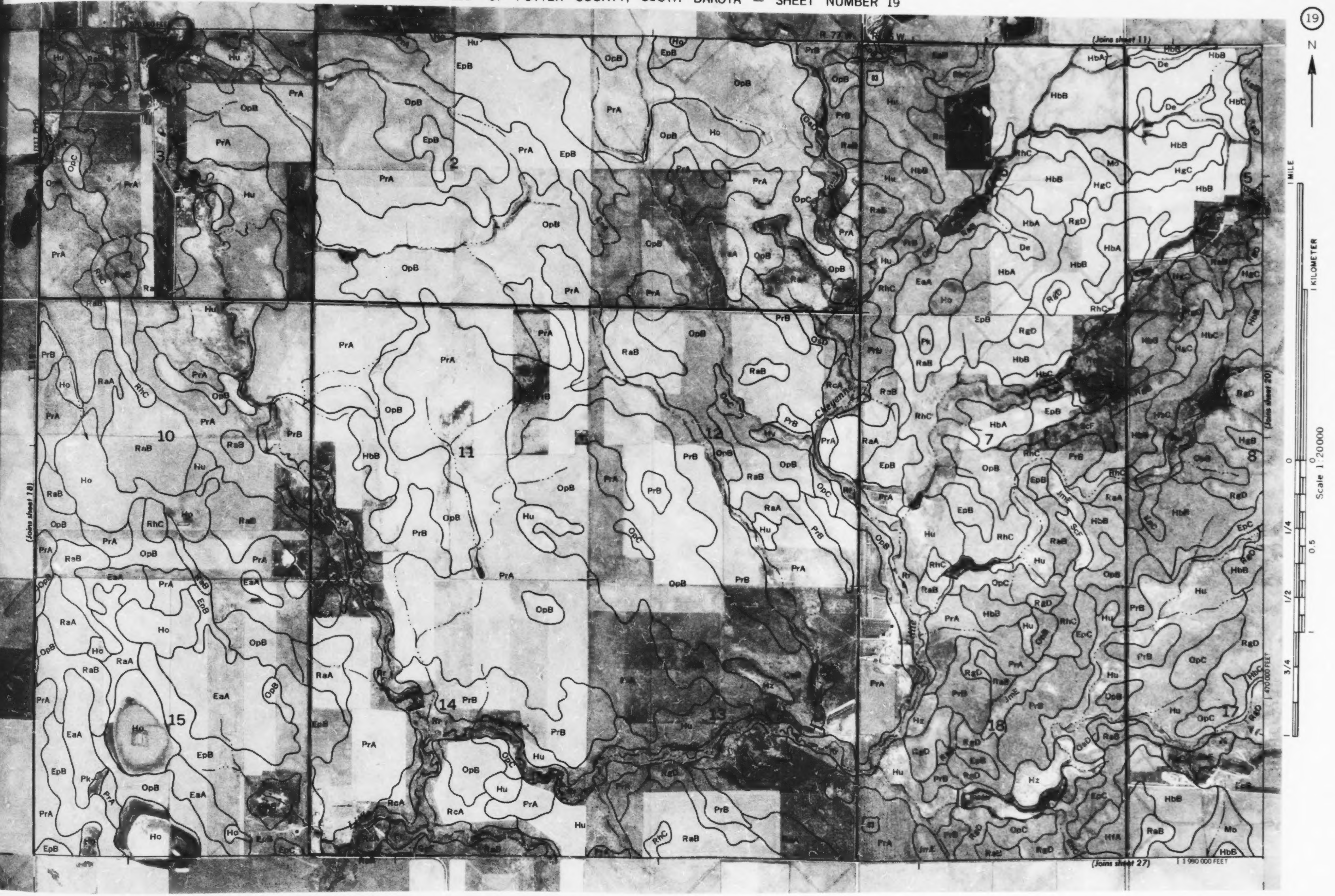


⑰
N
(Joins sheet 9)
R. 79 W.
(Joins sheet 18)
(Joins sheet 25)
470 000 FEET
1 940 000 FEET
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0.5
2
3
4
8
9
10
11
14
15
16
17
18
SaF
OkF
OsD
Hu
AgB
OpC
LoC
LoB
LoA
LoD
OpB
AmA
Pk
EpB
RaA

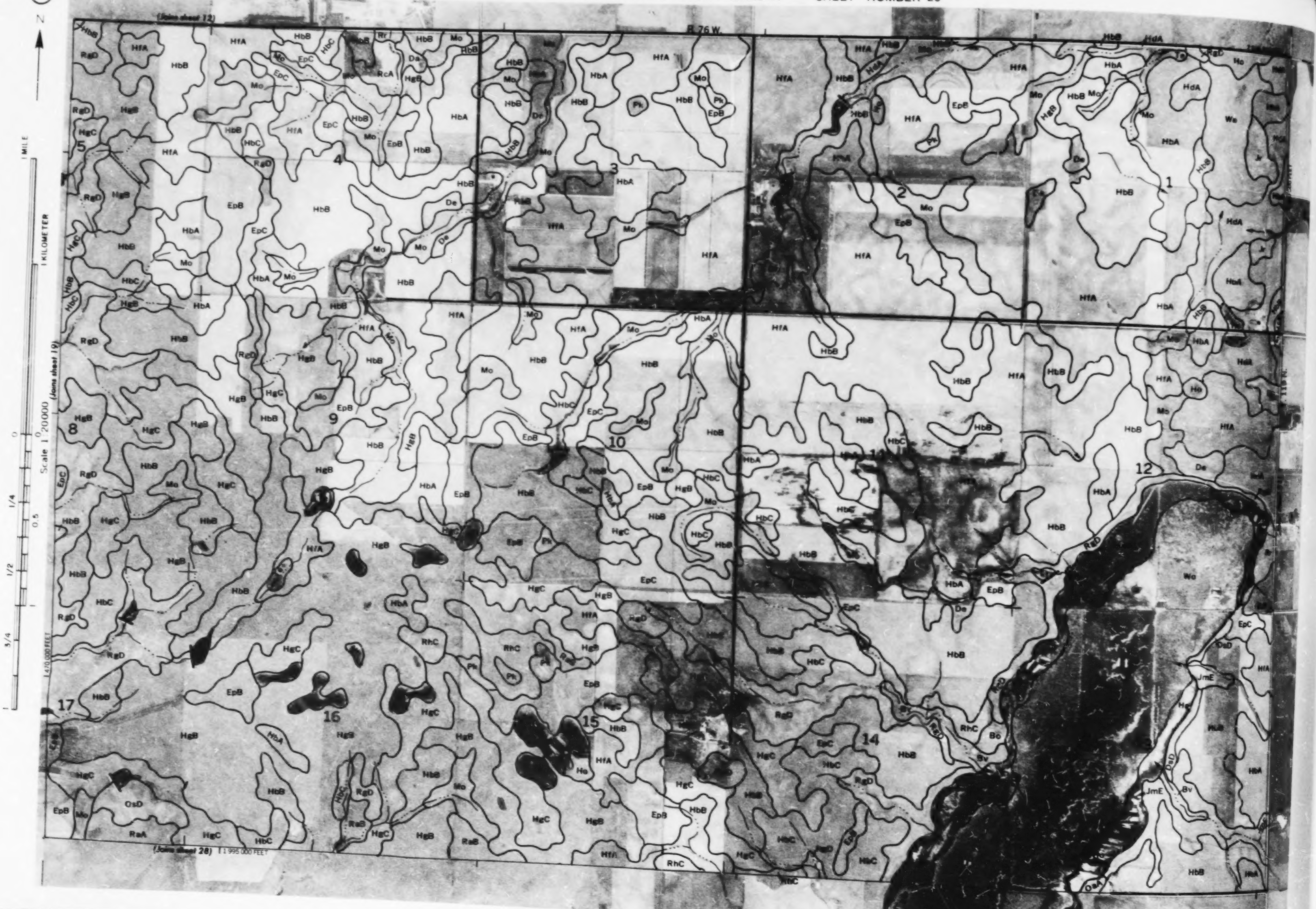
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 18


N
1 KILOMETER
Scale 1:20000
0
0.5
1
(Joins sheet 10)
R. 78 W.
R. 77 W.
1 965 000 FEET
(Joins sheet 17)
(Joins sheet 19)
(Joins sheet 26)
T. 119 N.
470 000 FEET
1
2
4
5
6
7
8
9
11
12
13
14
16
17
18

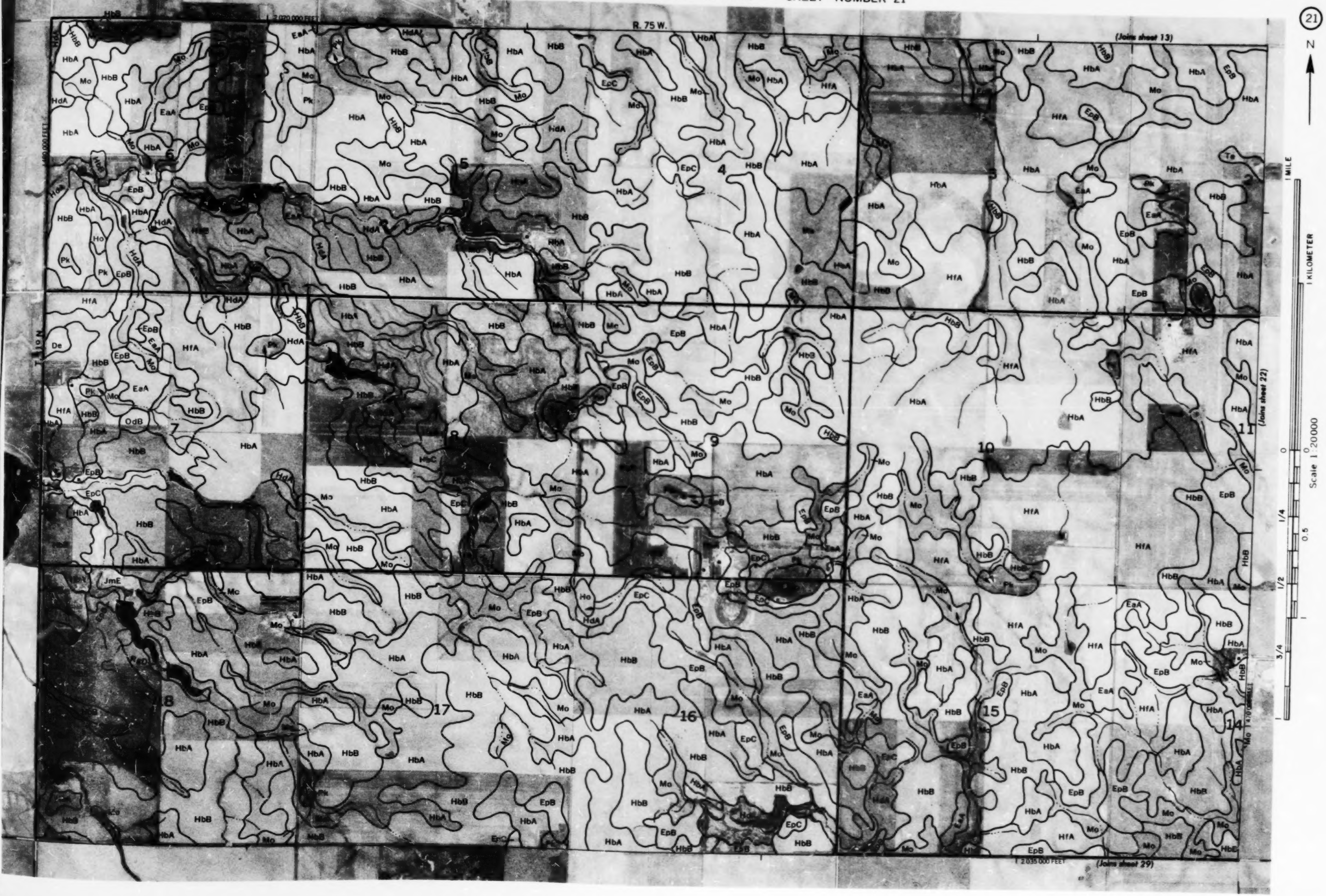
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 19


19
N
(Joins sheet 11)
(Joins sheet 18)
(Joins sheet 20)
(Joins sheet 27)
R. 77 W.
R. 76 W.
83
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
470 000 FEET
1 990 000 FEET
Cheyenne
1
2
3
5
7
8
10
11
12
13
14
15
17
18

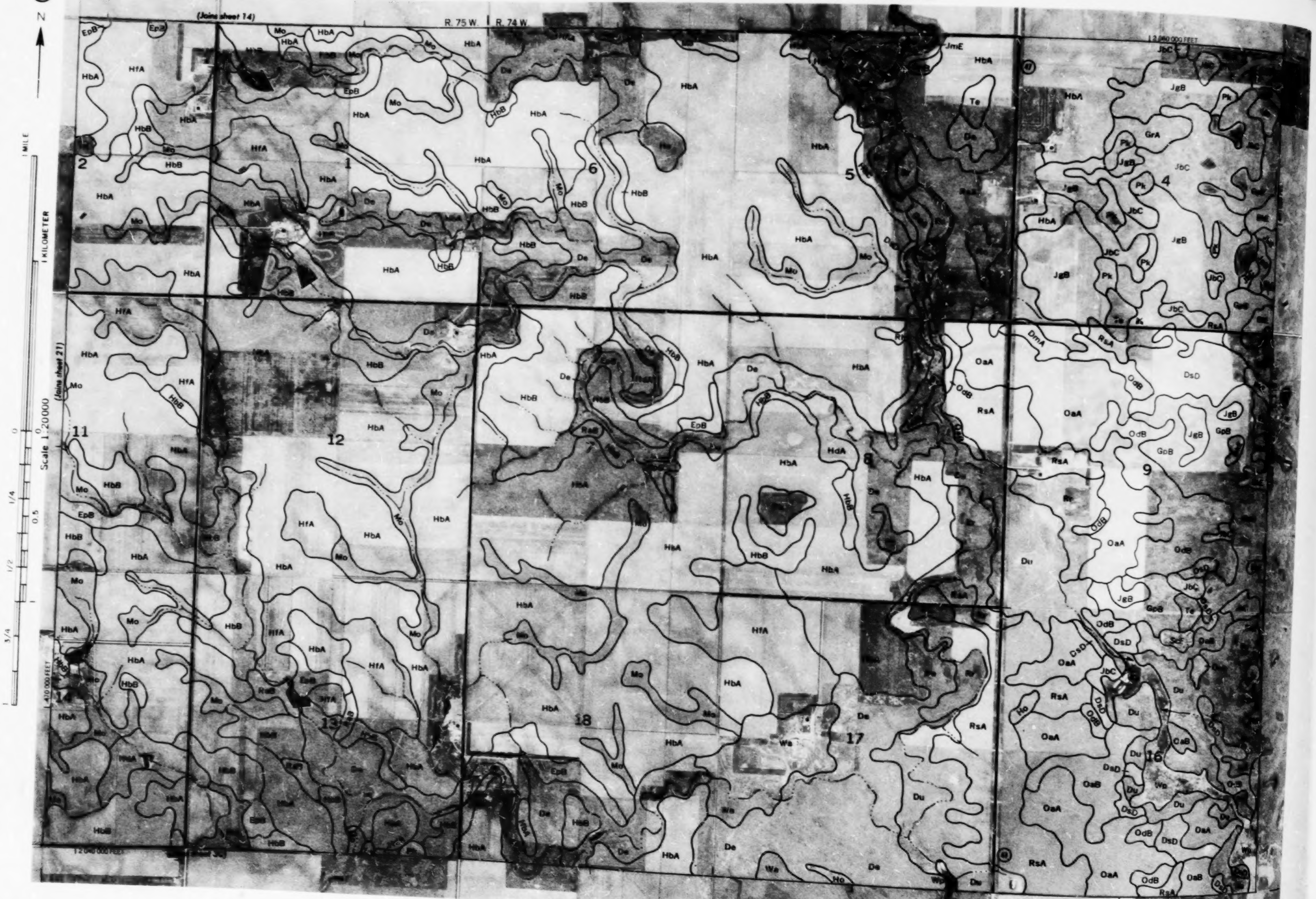
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 20


N
(Joins sheet 12)
R. 76 W.
(Joins sheet 19)
(Joins sheet 28)
1 995 000 FEET
1 470 000 FEET
T. 118 N.
Scale 1:20000
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
1
0.5
1
2
3
4
5
8
9
10
11
12
14
15
16
17
HbA
HbB
HbC
HfA
HgB
HgC
HdA
EpB
EpC
Mo
De
Pk
RgD
RcA
RhC
ReB
ReA
OsD
OaA
Bo
Bv
JmE
We
Ho

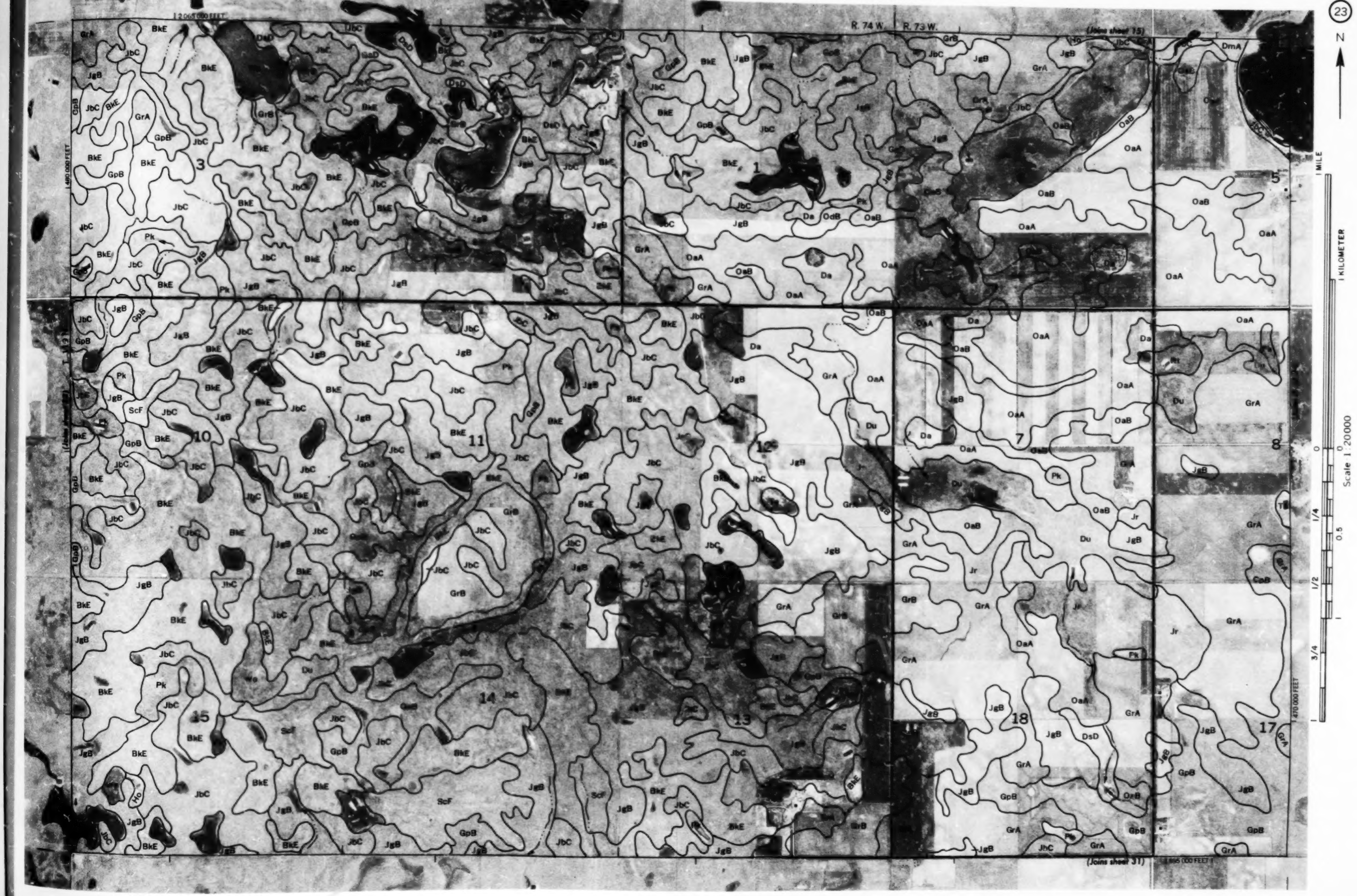
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 21


21
N
R. 75 W.
(Joins sheet 13)
(Joins sheet 22)
(Joins sheet 29)
T. 119 N.
2 030 000 FEET
2 035 000 FEET
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0.5
5
4
3
2
6
7
8
9
10
11
18
17
16
15
14
HbA
HbB
HdA
HfA
Mo
Pk
EaA
EpB
EpC
De
OdB
JmE
Ho
Te

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 22

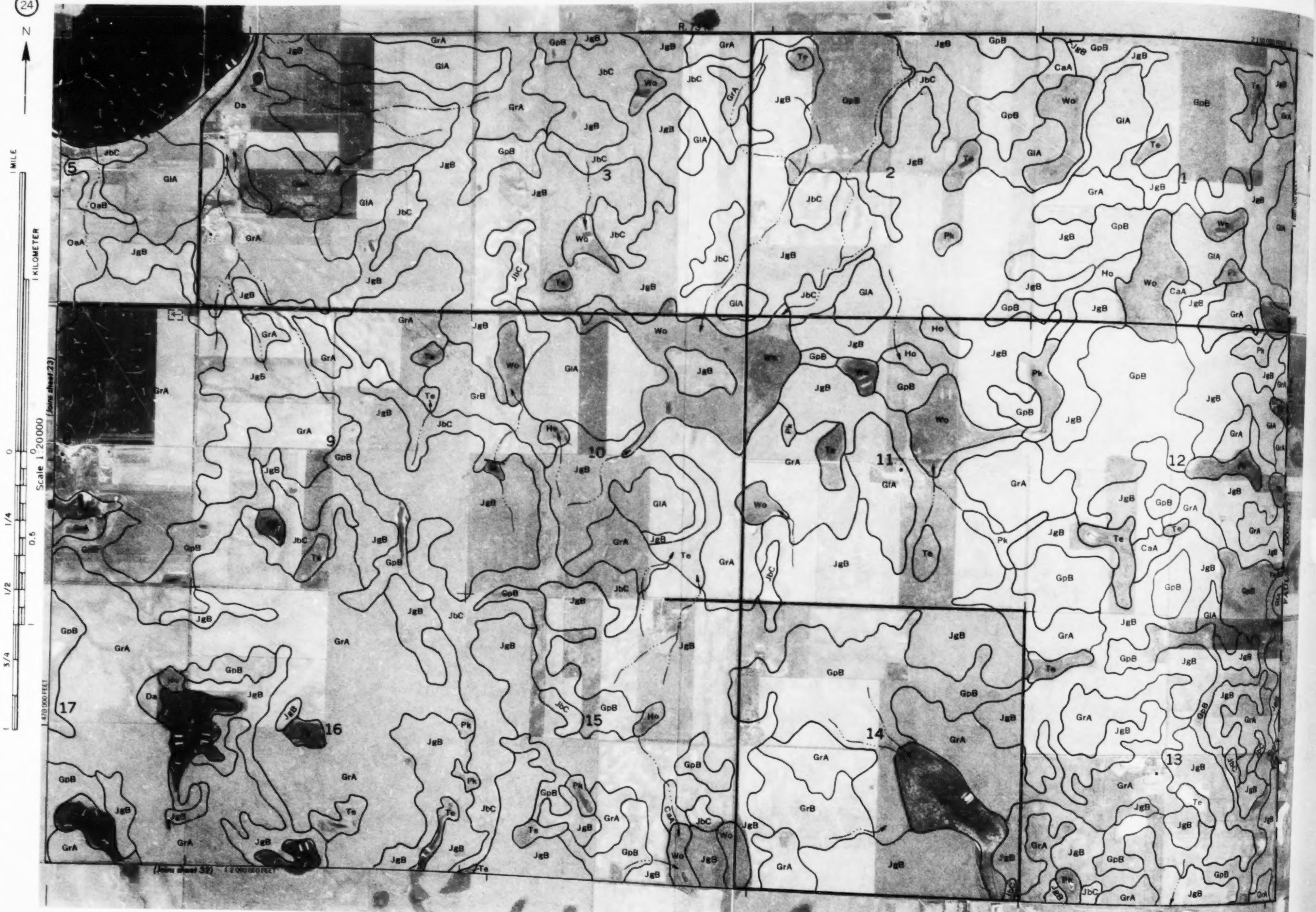

N
(Joins sheet 14)
(Joins sheet 21)
R. 75 W.
R. 74 W.
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
2 260 000 FEET
410 000 FEET
1 2 040 000 FEET
1
2
4
5
6
8
9
11
12
13
14
16
17
18
HbA
HbB
HfA
Mo
De
EpB
HdA
JbC
JgB
Pk
GrA
Te
RsA
OaA
OdB
DsD
DmA
GpB
Du
OaB
CaB
Wa
Ho
JmE

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 23

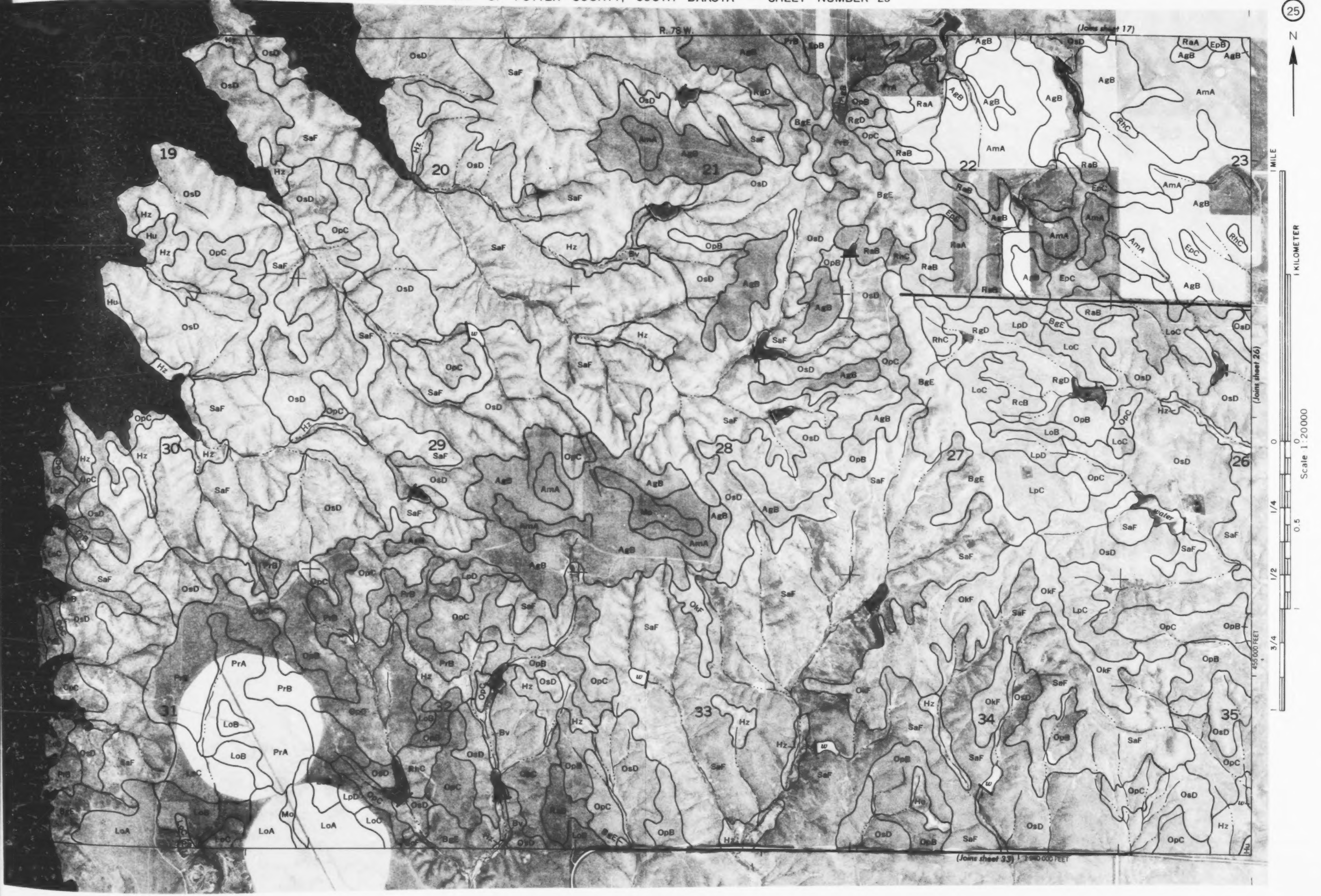


23
N
2 065 000 FEET
R. 74 W.
R. 73 W.
(Joins sheet 15)
(Joins sheet 31)
460 000 FEET
470 000 FEET
1 895 000 FEET
1 MILE
1 KILOMETER
Scale 1:20 000
0
1/4
1/2
3/4
1
0
0.5
1
3
1
5
10
11
12
7
8
15
14
13
18
17
BkE
JbC
JgB
GrA
GpB
GrB
DsD
Pk
OaA
OaB
OdB
Da
Du
Jr
DmA
ScF
Ho

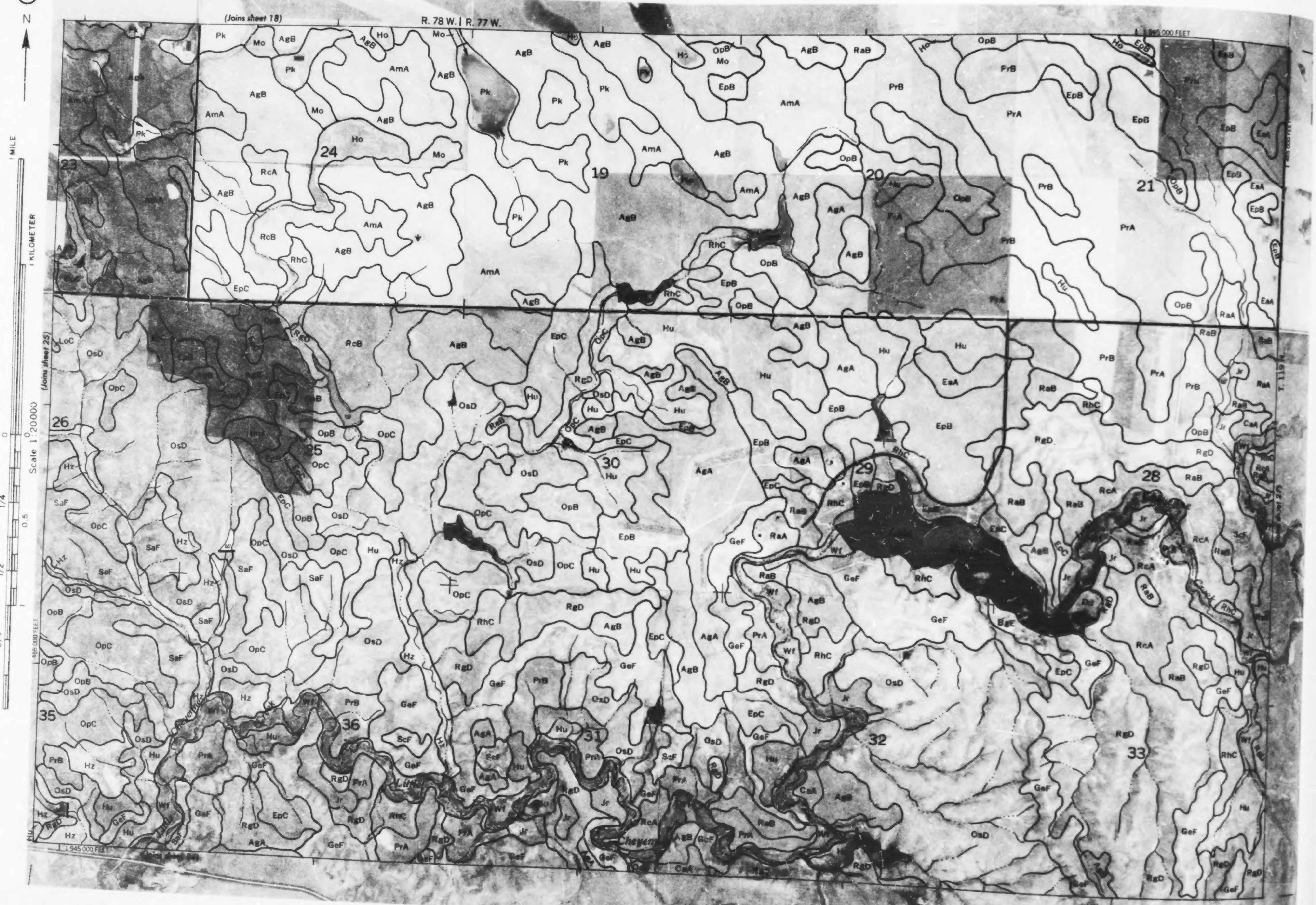
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 24


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
R. 79 W.
(Joins sheet 23)
(Joins sheet 32)
470 000 FEET
2 060 000 FEET
2 110 000 FEET
POTTER COUNTY
1
2
3
5
9
10
11
12
13
14
15
16
17
GrA
GlA
GpB
JgB
JbC
Wo
Te
Ho
Pk
CaA
Da
OaA
OaB
GrB

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 25

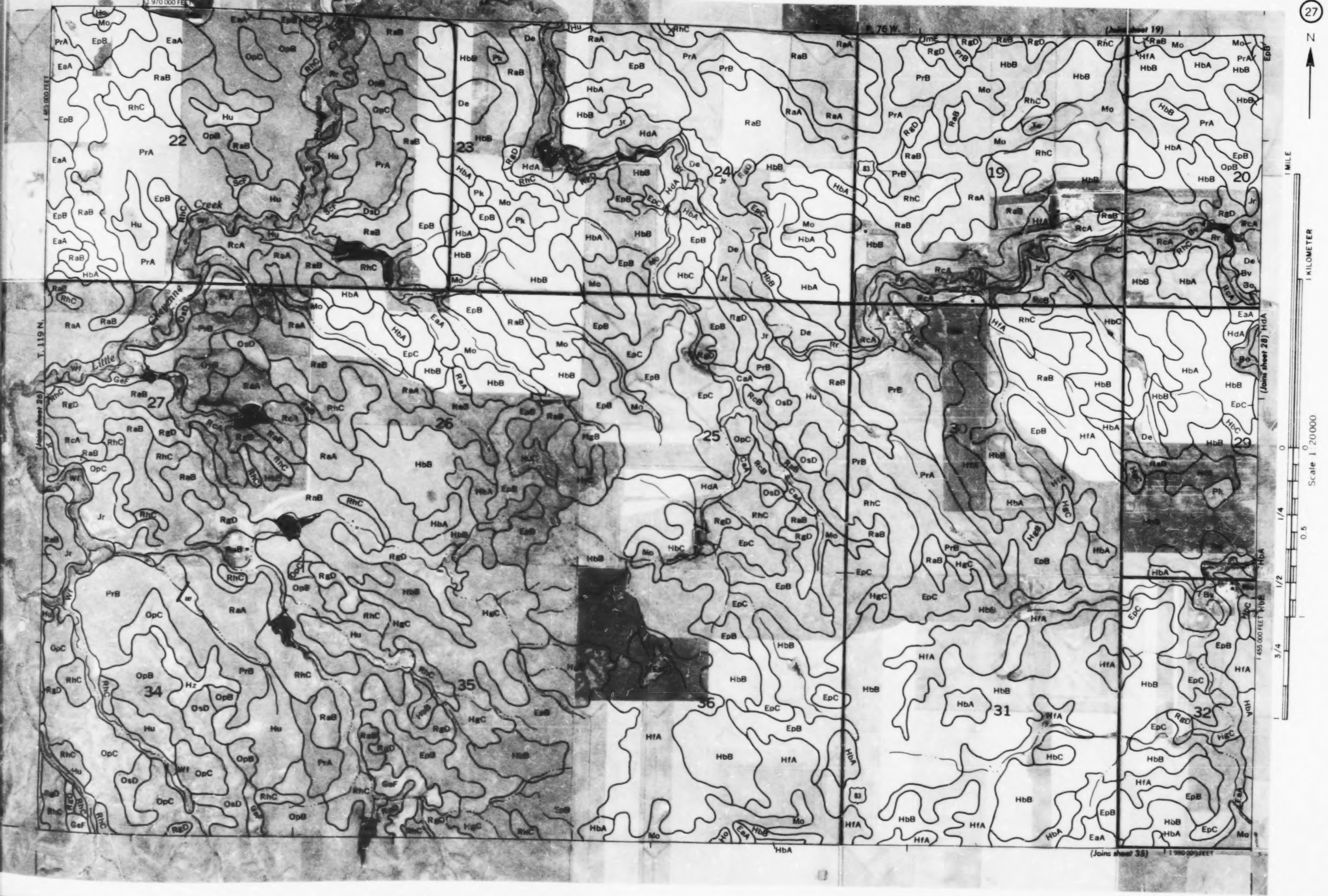

R. 78 W.
(Joins sheet 17)
(Joins sheet 26)
(Joins sheet 33)
1 940 000 FEET
1 455 000 FEET
N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
19
20
21
22
23
26
27
28
29
30
31
32
33
34
35

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 26

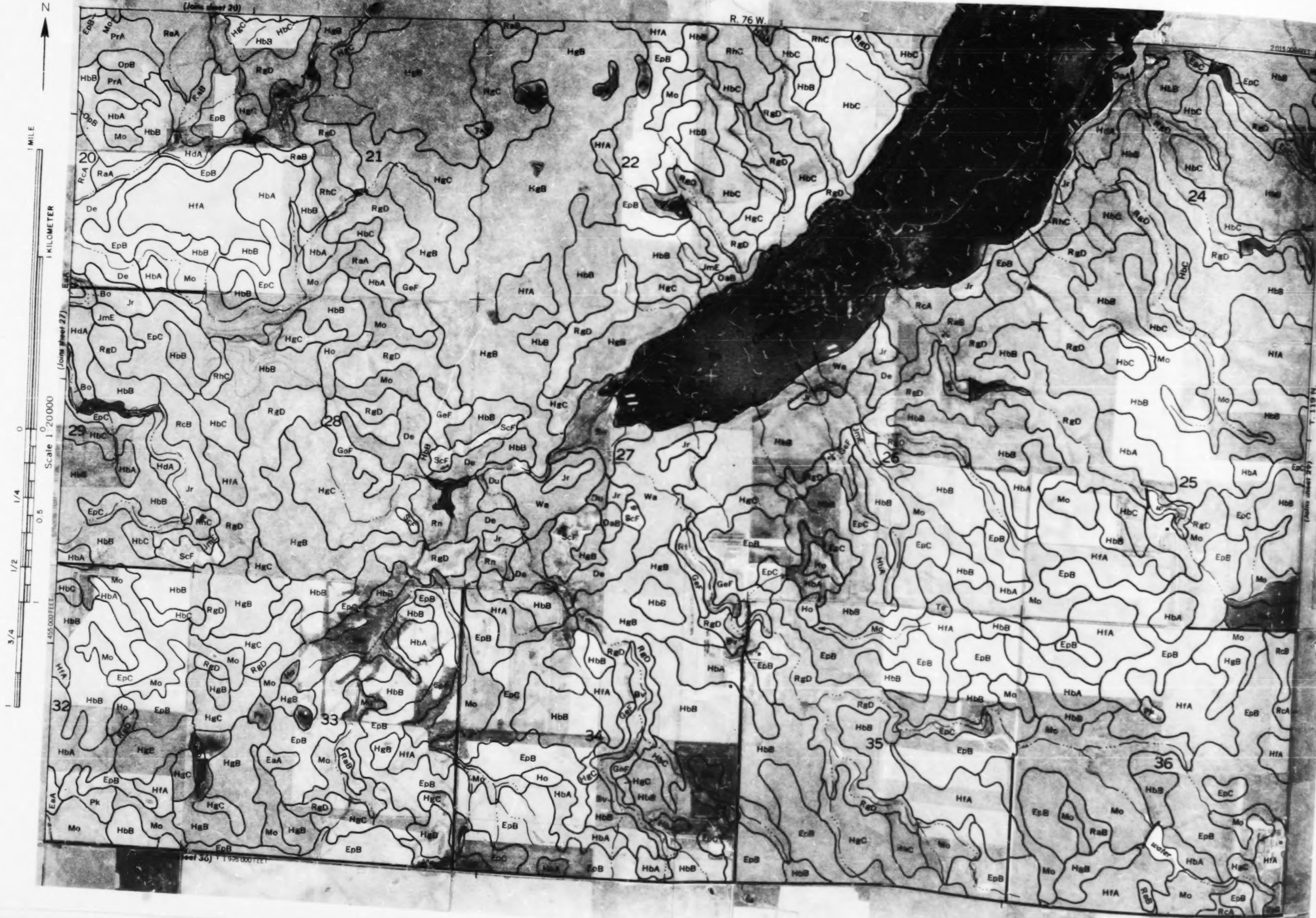

N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
0.5
1/2
3/4
1
(Joins sheet 18)
R. 78 W. | R. 77 W.
1 965 000 FEET
(Joins sheet 25)
455 000 FEET
1 945 000 FEET
(Joins sheet 34)
T. 119 N.
24
19
20
21
23
26
25
30
29
28
35
36
31
32
33
Cheyenne
Little
Creek

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 27

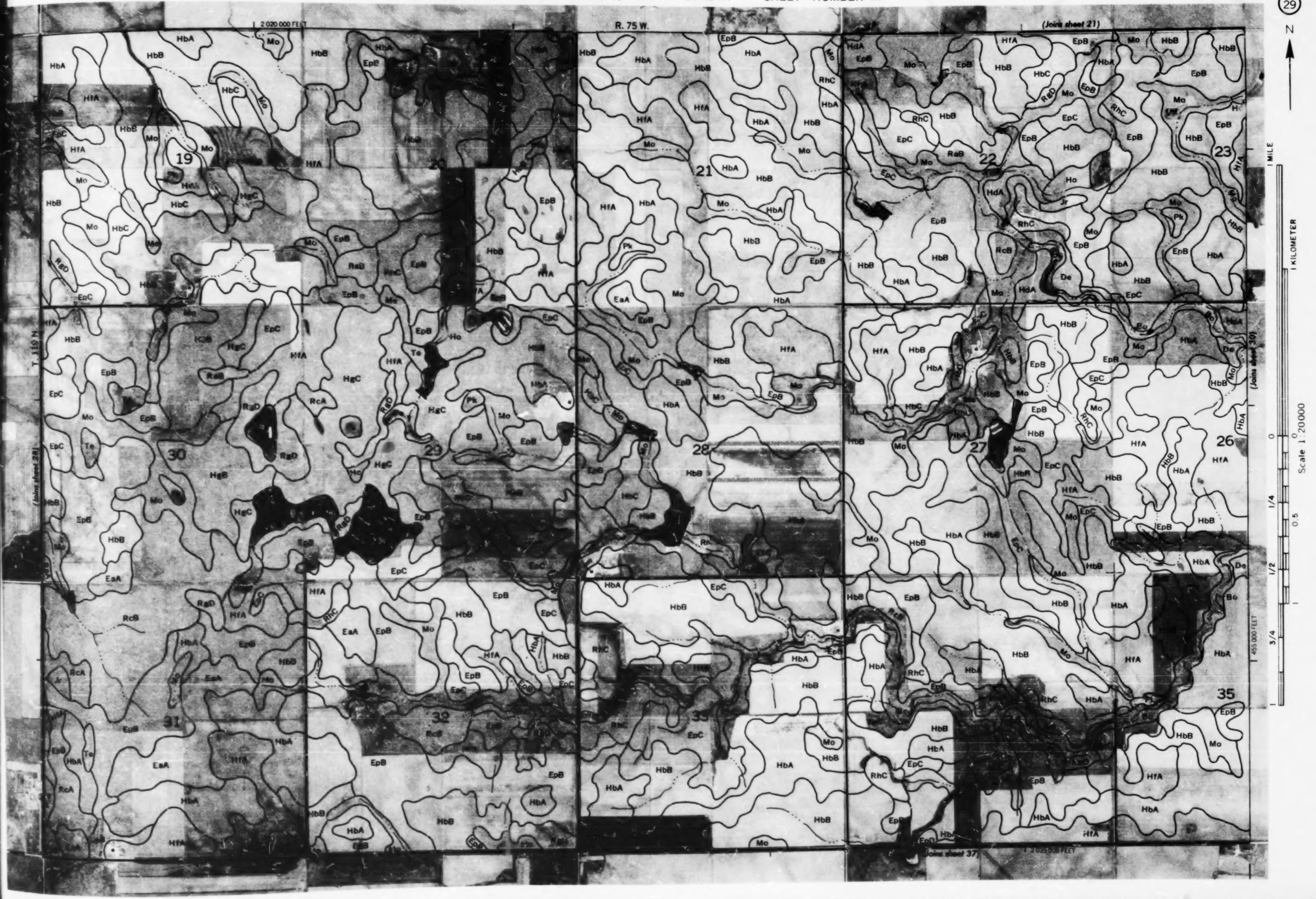
㉗


1 970 000 FEET
R. 76 W.
(Joins sheet 19)
(Joins sheet 28)
(Joins sheet 35)
(Joins sheet 26)
T. 119 N.
1 455 000 FEET
1 990 000 FEET
N
1 MILE
1 KILOMETER
Scale 1:20 000
0
1/4
1/2
3/4
0.5
1
19
20
22
23
24
25
26
27
29
30
31
32
34
35
36
Little
Cheyenne
Creek
83

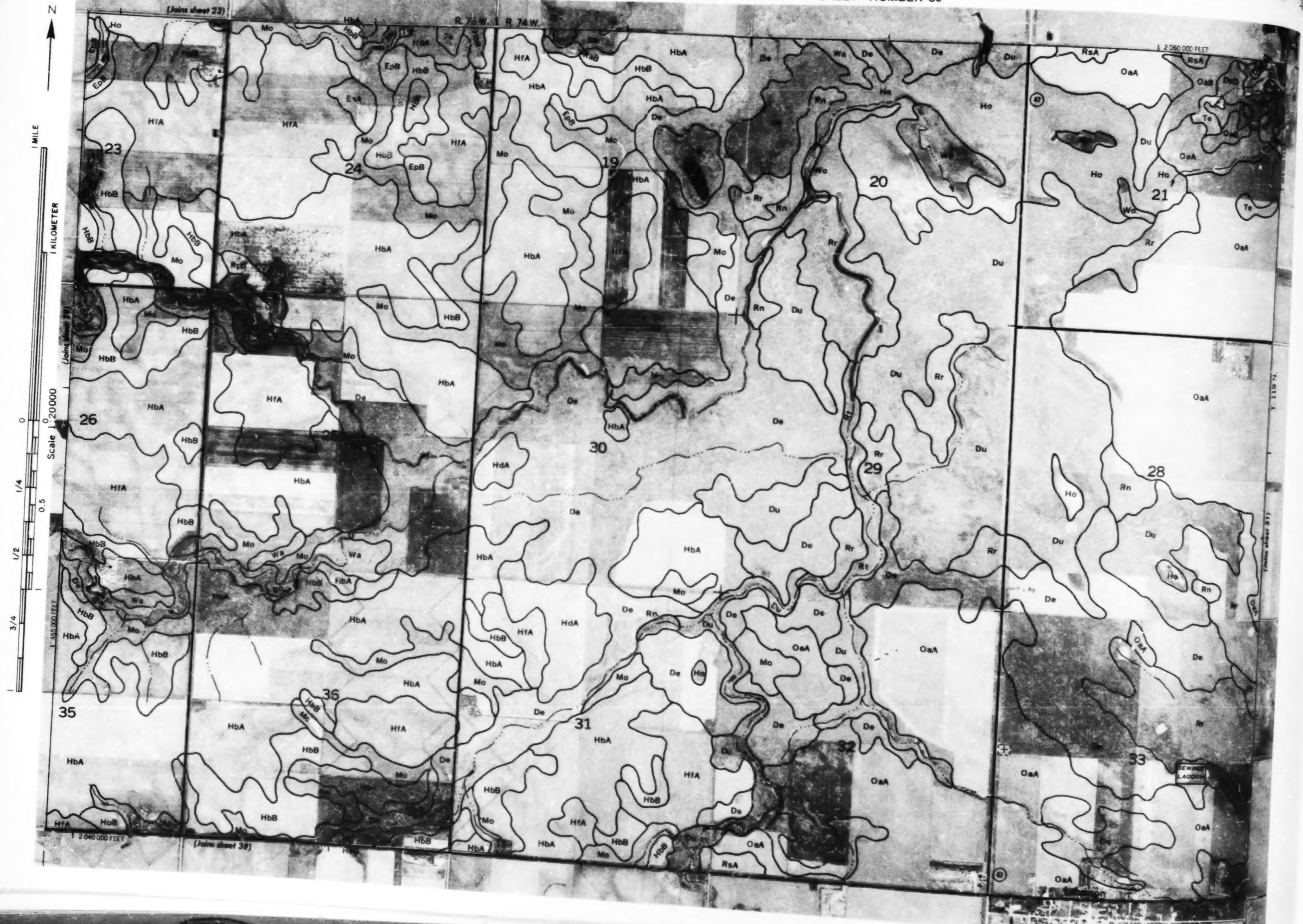
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 28


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
(Joins sheet 20)
R. 76 W.
2 015 000 FEET
(Joins sheet 27)
455 000 FEET
T. 119 N.
(Joins sheet 29)
(Joins sheet 36)
1 995 000 FEET
20
21
22
24
25
26
27
28
29
32
33
34
35
36
water

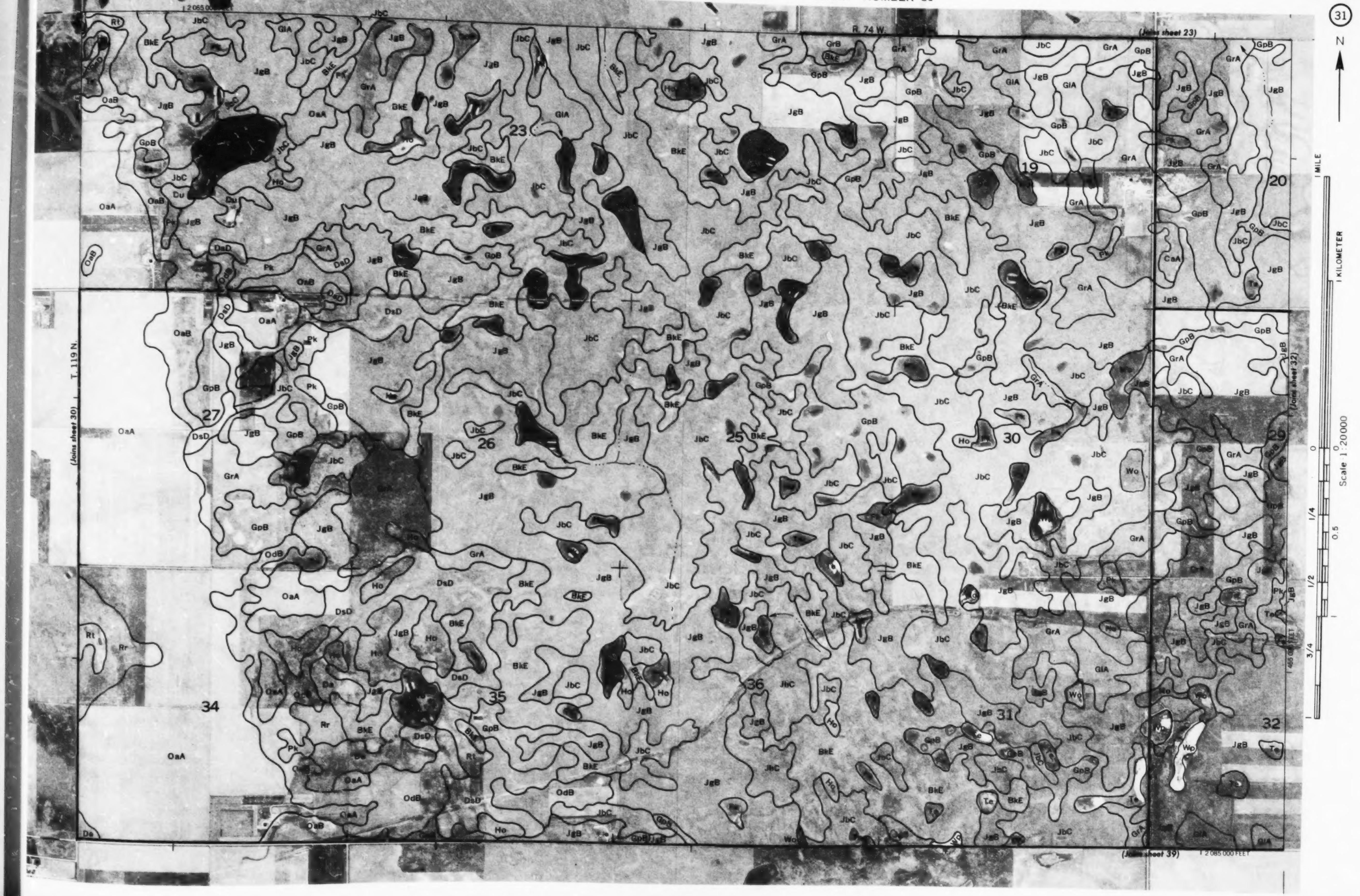
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 29


2 020 000 FEET
R. 75 W.
(Joins sheet 21)
N
T. 119 N.
(Joins sheet 28)
(Joins sheet 30)
(Joins sheet 37)
2 035 000 FEET
455 000 FEET
19
20
21
22
23
30
29
28
27
26
31
32
33
35
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5

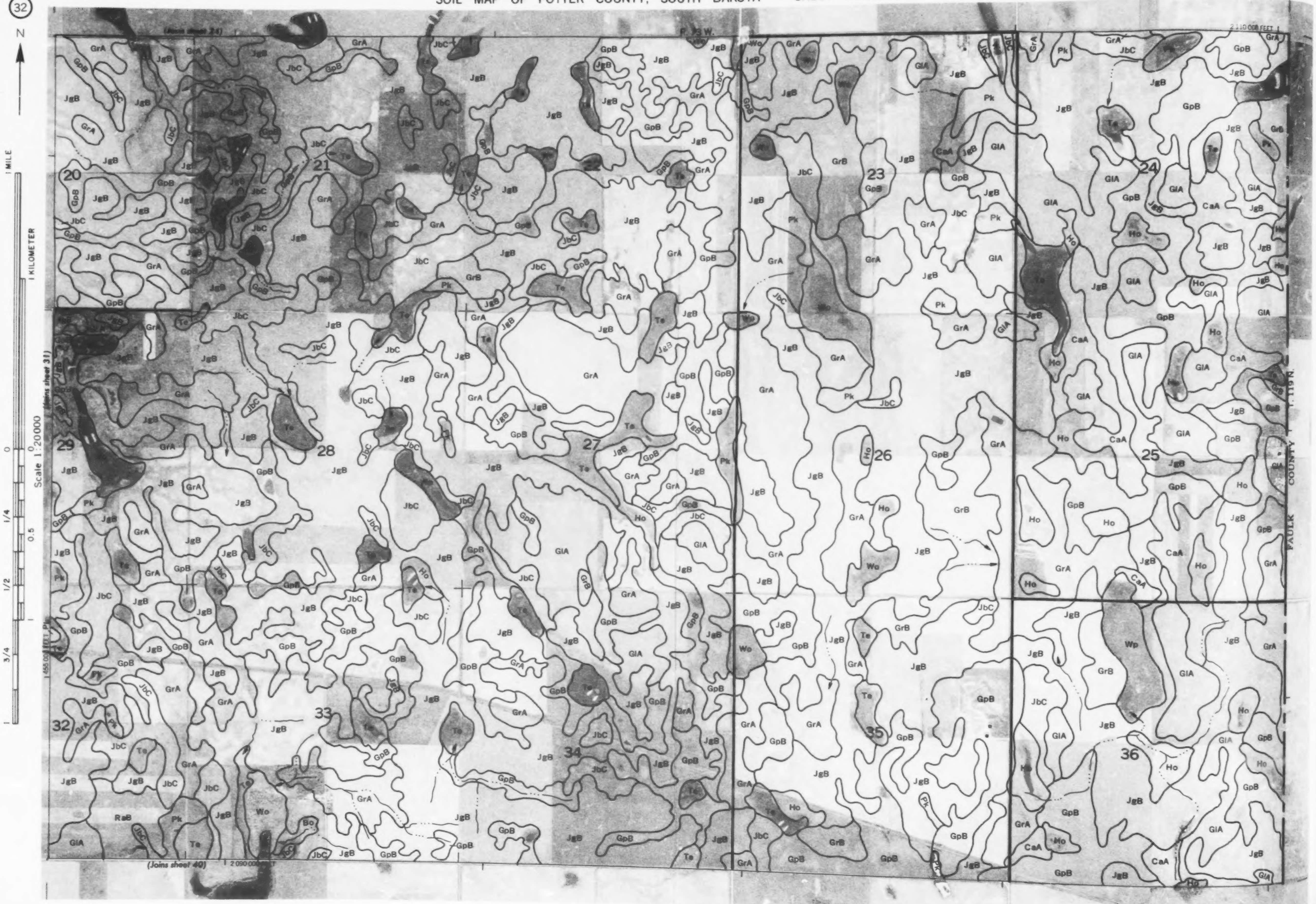
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 30


N
(Joins sheet 22)
R. 75 W. | R. 74 W.
2 050 000 FEET
T. 119 N.
(Joins sheet 31)
(Joins sheet 38)
(Joins sheet 29)
2 040 000 FEET
155 000 FEET
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0.5
23
24
19
20
21
26
25
30
29
28
35
36
31
32
33
SEWAGE LAGOON
Ho
EpB
HbA
HbB
HfA
HdA
Mo
EsA
De
Du
Wa
Rr
Rn
Rt
Wo
OaA
OaB
RsA
Te
RcB
Ha

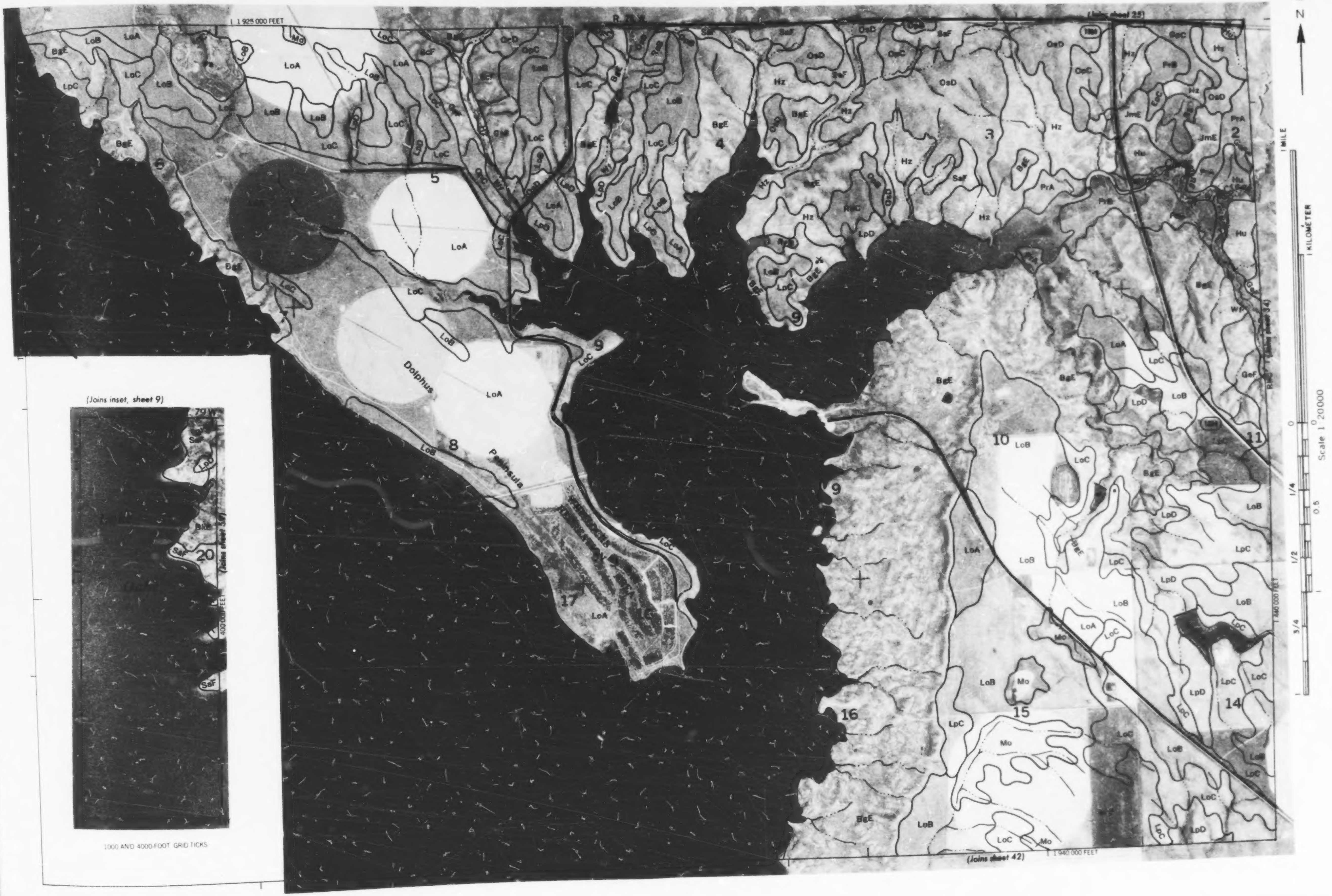
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 31


31
N
R. 74 W.
T. 119 N.
(Joins sheet 23)
(Joins sheet 32)
(Joins sheet 39)
(Joins sheet 30)
2 065 000 FEET
2 085 000 FEET
465 000 FEET
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0.5
19
20
23
25
26
27
29
30
31
32
34
35
36
JbC
JgB
BkE
GrA
GlA
GpB
OaA
OaB
OdB
DsD
Ho
Pk
Rt
Rr
Te
Wo
Cu
Du
Da

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 32

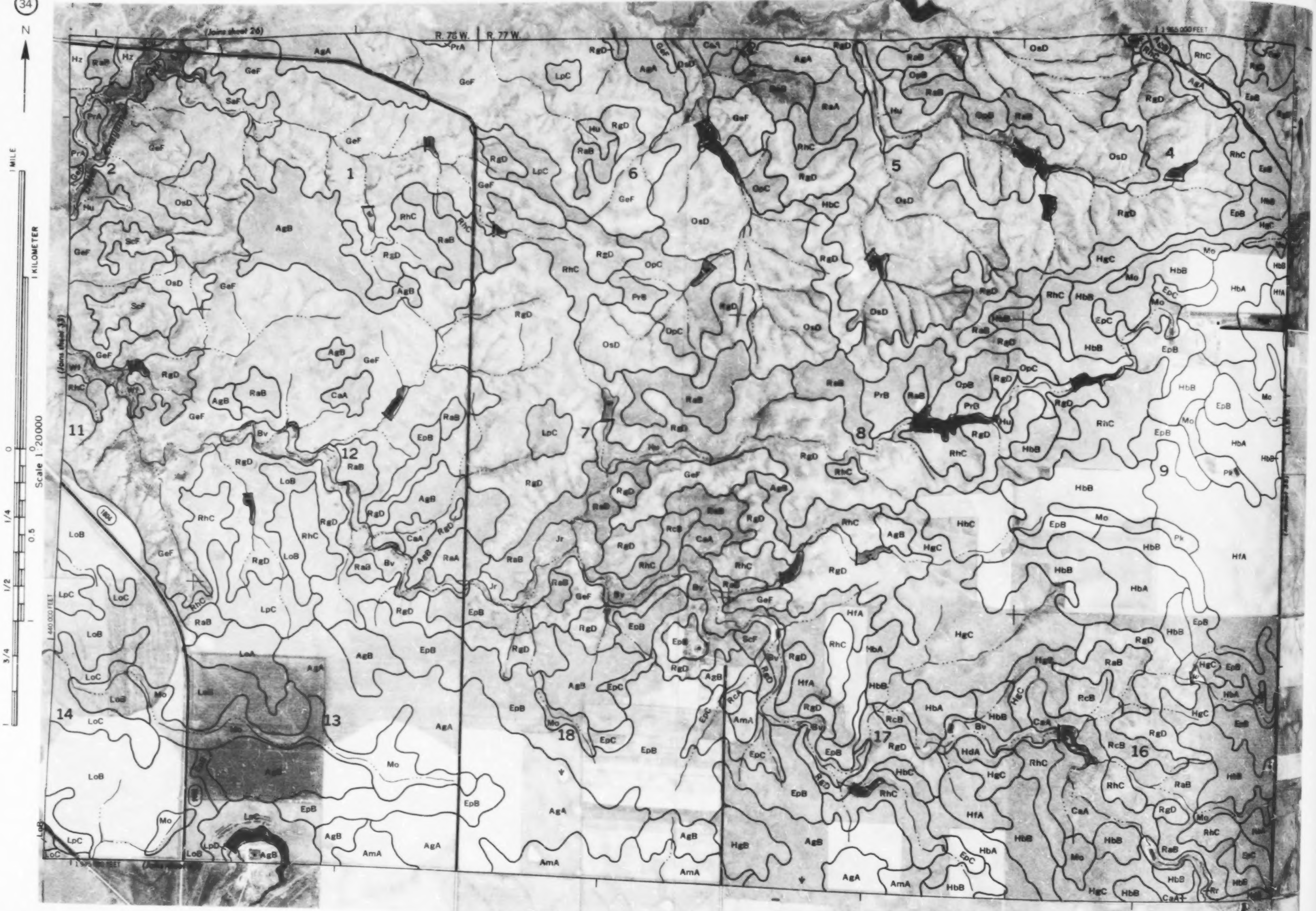

N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
(Joins sheet 24)
(Joins sheet 31)
(Joins sheet 40)
R. 75 W.
T. 119 N.
FAULK COUNTY
2 110 000 FEET
1 455 000 FEET
2 090 000 FEET
20
21
22
23
24
25
26
27
28
29
32
33
34
35
36

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 33

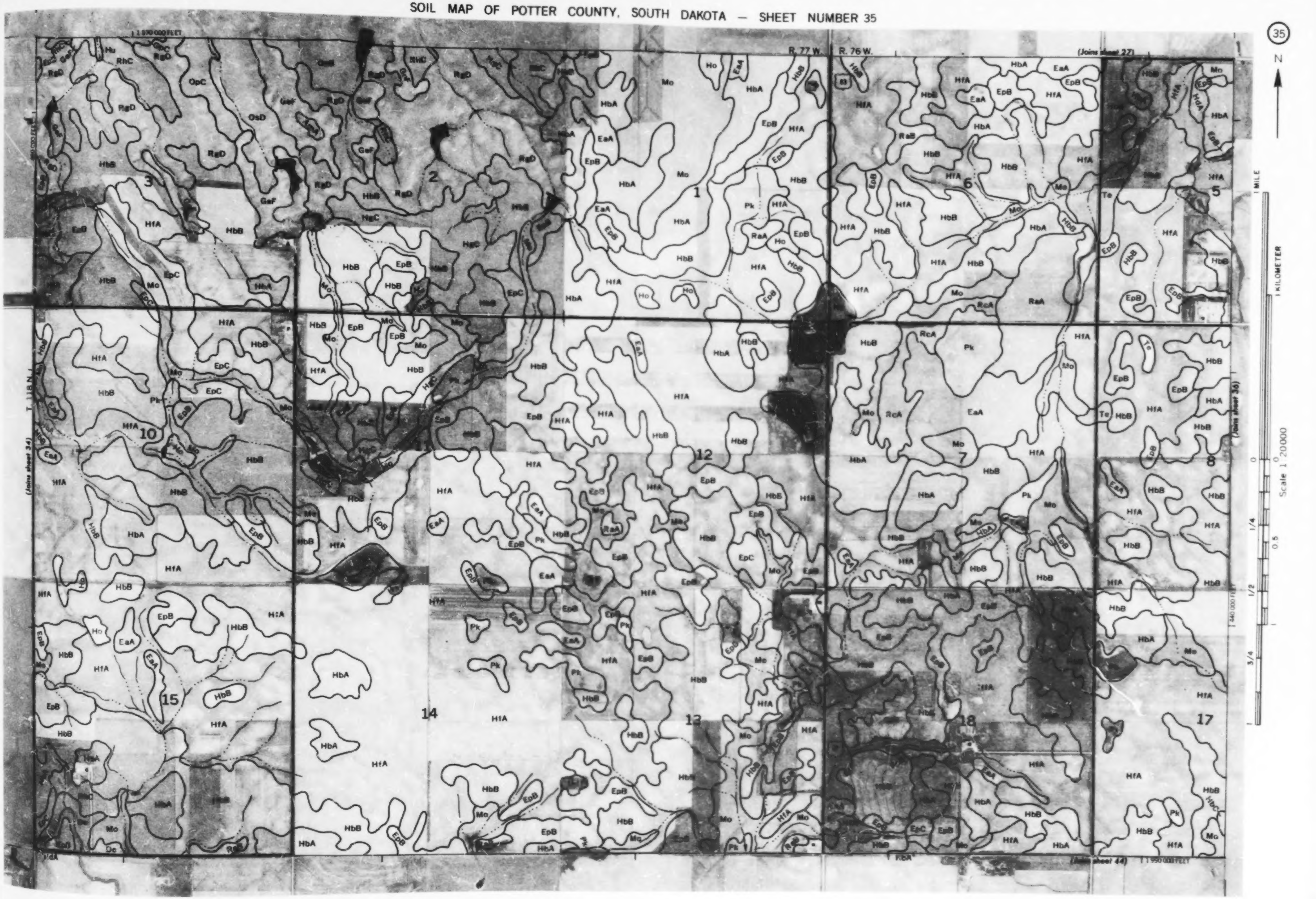

1 925 000 FEET
R 79 W
(Joins sheet 25)
N
1 MILE
1 KILOMETER
Scale 1:20 000
0
1/4
1/2
3/4
1
0.5
(Joins sheet 34)
1 940 000 FEET
(Joins sheet 42)
(Joins inset, sheet 9)
(Joins sheet 34)
400 000 FEET
1 440 000 FEET
1000 AND 4000-FOOT GRID TICKS
Dolphus
Peninsula
Oahe
2
3
4
5
6
7
8
9
10
11
14
15
16
17
20
LoA
LoB
LoC
LpC
LpD
BgE
OsD
OsC
OpC
SaF
Hz
Hu
PrA
PrB
JmE
GeF
Wp
Mo
BkE
1804

③④

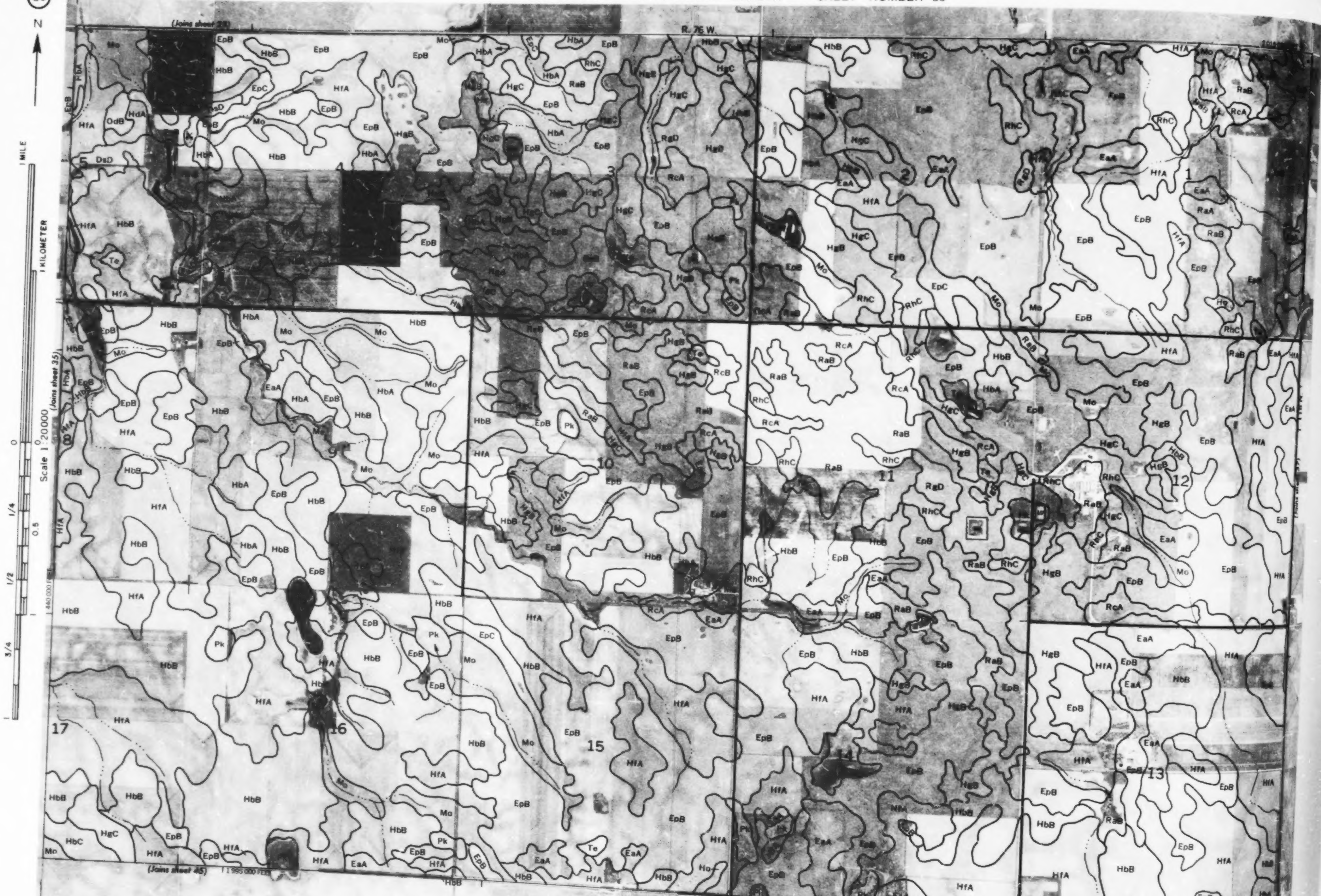
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 34


N
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
1
0
0.5
1
Scale 1:20000
(Joins sheet 26)
R. 76 W.
R. 77 W.
1 965 000 FEET
(Joins sheet 33)
1 440 000 FEET
1 590 000 FEET
1
2
4
5
6
7
8
9
11
12
13
14
16
17
18
1804
Hz
RaB
GeF
SeF
PrA
AgA
PrA
GeF
OsD
ScF
GeF
OsD
ScF
AgB
RhC
RaB
RgD
AgB
GeF
CaA
RgD
AgB
RaB
EpB
Bv
RgD
RaB
LoB
AgB
RhC
RgD
RhC
CaA
RaB
Bv
RaA
LoB
LpC
LoC
LoB
RaB
LpC
RgD
EpB
AgB
LoA
AgA
LoC
LoB
Mo
LoC
LoB
Mo
AgA
Mo
LoB
LpC
LoC
LoB
LpD
AgB
EpB
AgB
AmA
AgA
PrA
GeF
LpC
RgD
Hu
RaB
RgD
LpC
GeF
RhC
RgD
OpC
PrB
OpC
OsD
RgD
LpC
Jr
RaB
GeF
Bv
RgD
EpB
AgB
EpC
EpB
Mo
EpC
EpB
AgA
AmA
AmA
AgB
CaA
AgA
OsD
GeF
RaA
RhC
RgD
OpC
HbC
OsD
RgD
RaB
GeF
RgD
RcB
CaA
RhC
Bv
ScF
EpB
AmA
EpC
RcA
AgB
RaB
OpB
RaB
Hu
OsD
RgD
PrB
OpB
PrB
RhC
RgD
Hu
HbB
RgD
RhC
AgB
HgC
HfA
RhC
HbA
HbB
HfA
RgD
EpB
RhC
HbC
HgB
AgB
AgA
AmA
HbA
EpC
HbB
OsD
RgD
RhC
AgA
EpB
HgC
Mo
HbB
EpC
HbA
HfA
HbB
EpC
RhC
HbB
RgD
OpC
RgD
HbB
EpB
EpB
HbB
Mo
HbA
RhC
HbB
EpB
Mo
HbA
Pk
HbB
HbC
EpB
Mo
HbB
Pk
HfA
HbA
HgC
HbB
EpB
RgD
RaB
HgB
HgC
RcB
HgC
HbA
HbB
CaA
Bv
HdA
HgC
RhC
RgD
RcB
RhC
RaB
HbA
HfA
HbB
Mo
CaA
HbB
HgC
RaB
RgD
Mo
RhC
HbB
HbB
CaA
Rr
HbB

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 35

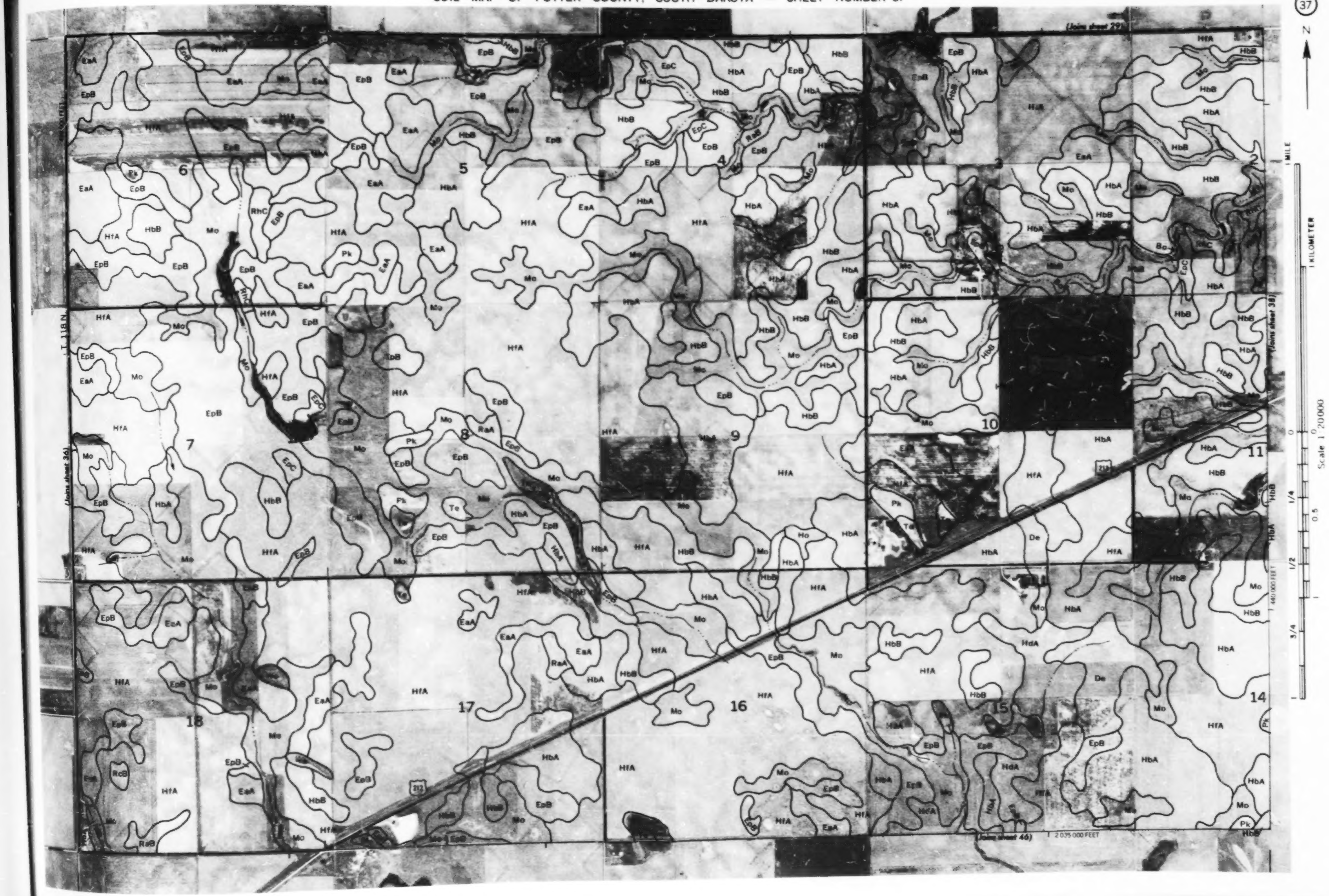

35
N
1 970 000 FEET
R. 77 W.
R. 76 W.
(Joins sheet 27)
(Joins sheet 34)
(Joins sheet 36)
(Joins sheet 44)
T. 118 N.
540 000 FEET
1 950 000 FEET
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
0.5
1
2
3
5
6
7
8
10
11
12
13
14
15
17
18

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 36

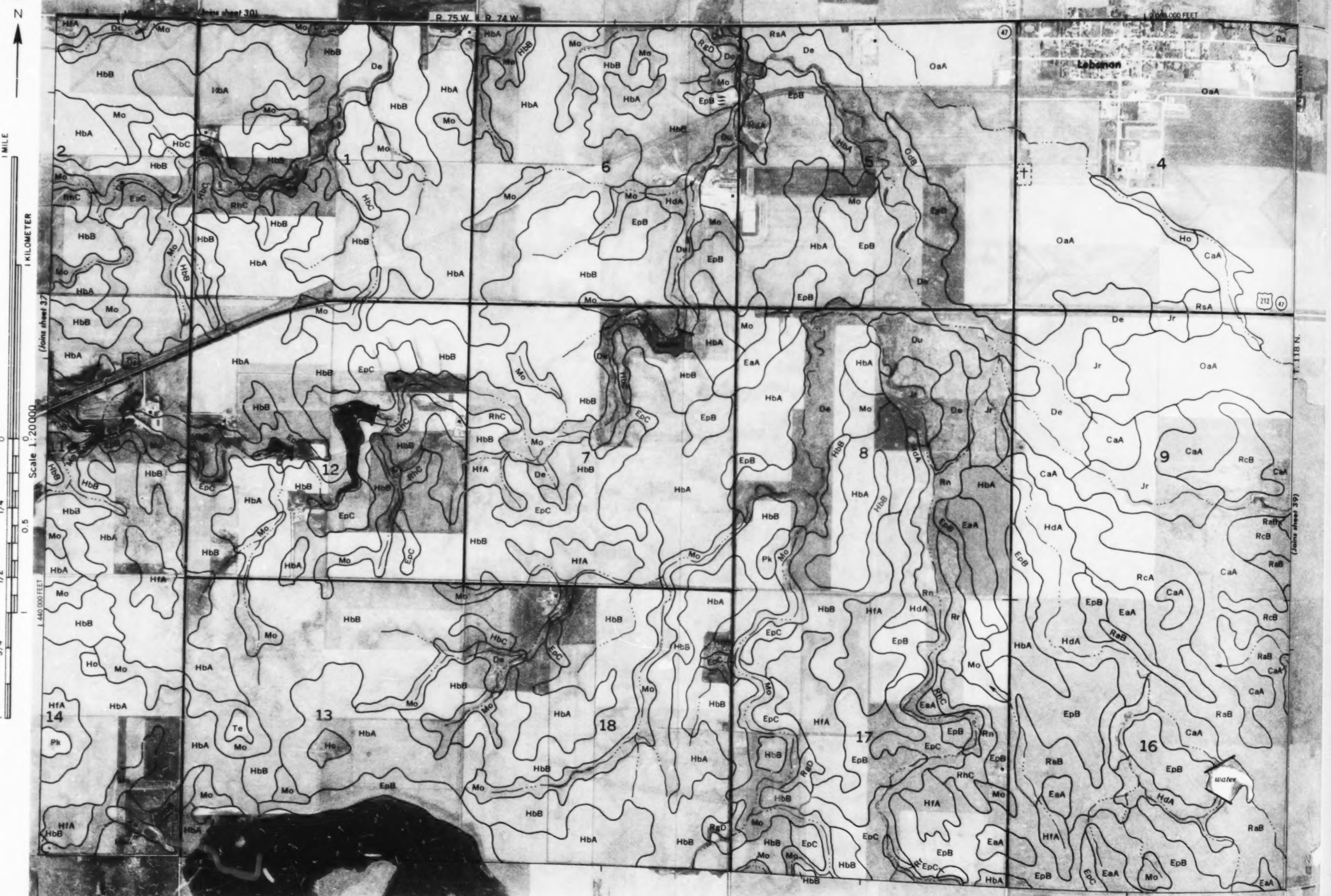

N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
0.5
1/2
3/4
1
(Joins sheet 28)
R. 76 W.
(Joins sheet 35)
(Joins sheet 45)
440 000 FEET
1 995 000 FEET
1
2
3
4
5
8
9
10
11
12
13
14
15
16
17
EpB
EpC
HbA
HbB
HbC
HdA
HfA
HgB
HgC
Mo
OdB
DsD
Te
Pk
RaB
RcA
RcB
RgD
RhC
EaA
FbA
Ho

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 37

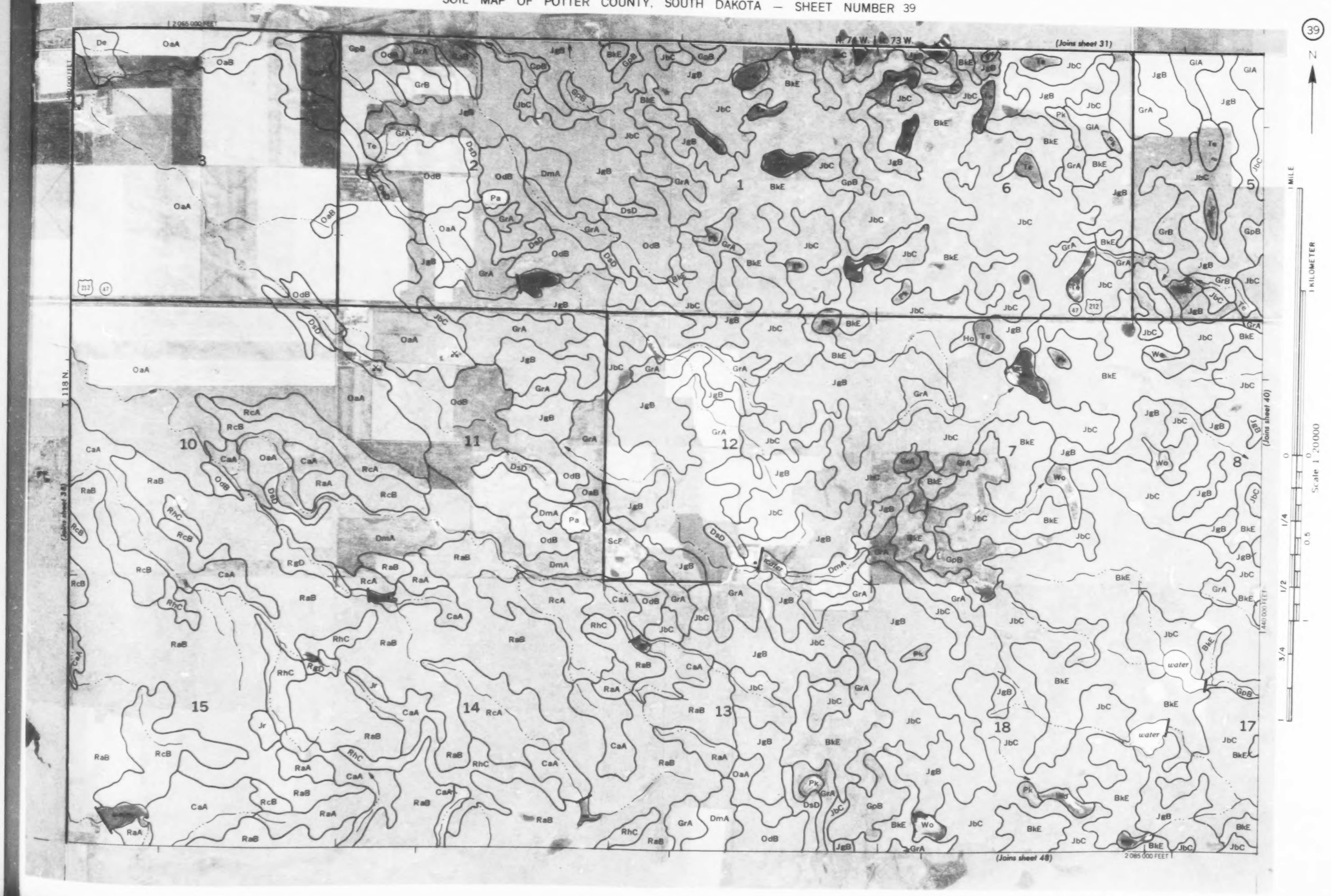
㊲


(Joins sheet 29)
(Joins sheet 38)
(Joins sheet 36)
(Joins sheet 46)
T. 118 N.
6
5
4
3
2
7
8
9
10
11
18
17
16
15
14
212
2 035 000 FEET
440 000 FEET
N
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
1
0
0.5
Scale 1:20000

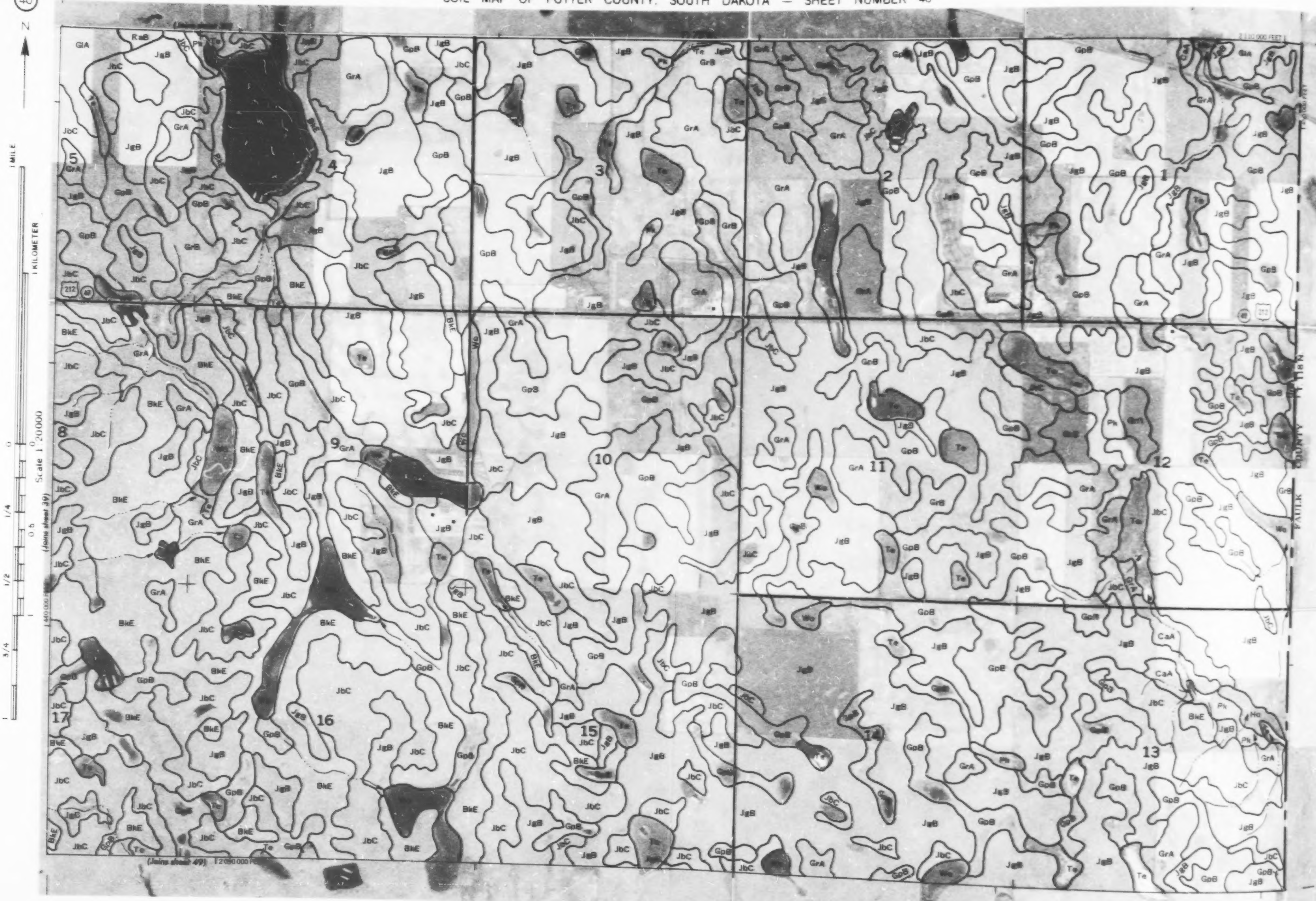
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 38


N
1 MILE
1 KILOMETER
Scale 1:20000
(Joins sheet 30)
R. 75 W.
R. 74 W.
2 070 000 FEET
Lebanon
(Joins sheet 37)
(Joins sheet 39)
T. 118 N.
1 440 000 FEET
212
47
water
1
2
4
5
6
7
8
9
11
12
13
14
16
17
18

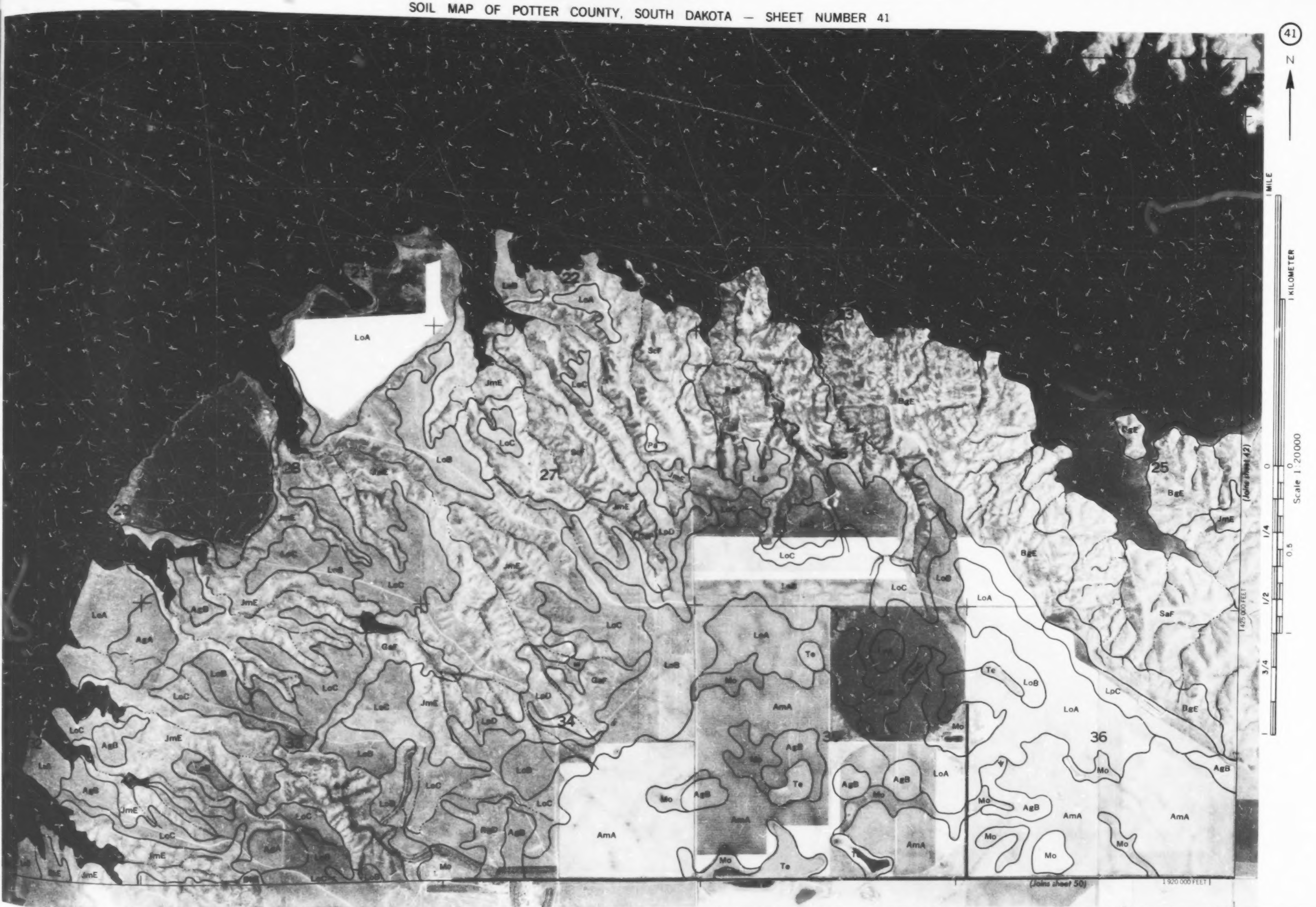
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 39


(Joins sheet 31)
R. 74 W. | R. 73 W.
2 065 000 FEET
T. 113 N.
(Joins sheet 38)
(Joins sheet 40)
(Joins sheet 48)
2 085 000 FEET
440 000 FEET
N
1 MILE
1 KILOMETER
Scale 1:20 000
0
1/4
1/2
3/4
0.5
1
2
3
5
6
7
8
10
11
12
13
14
15
17
18
212
47
water
OaA
OaB
OdB
De
GpB
GrA
GrB
JgB
JbC
BkE
Te
DsD
DmA
Pa
GlA
Pk
Ho
Wo
ScF
CaA
RaA
RaB
RcA
RcB
RhC
RgD
Jr

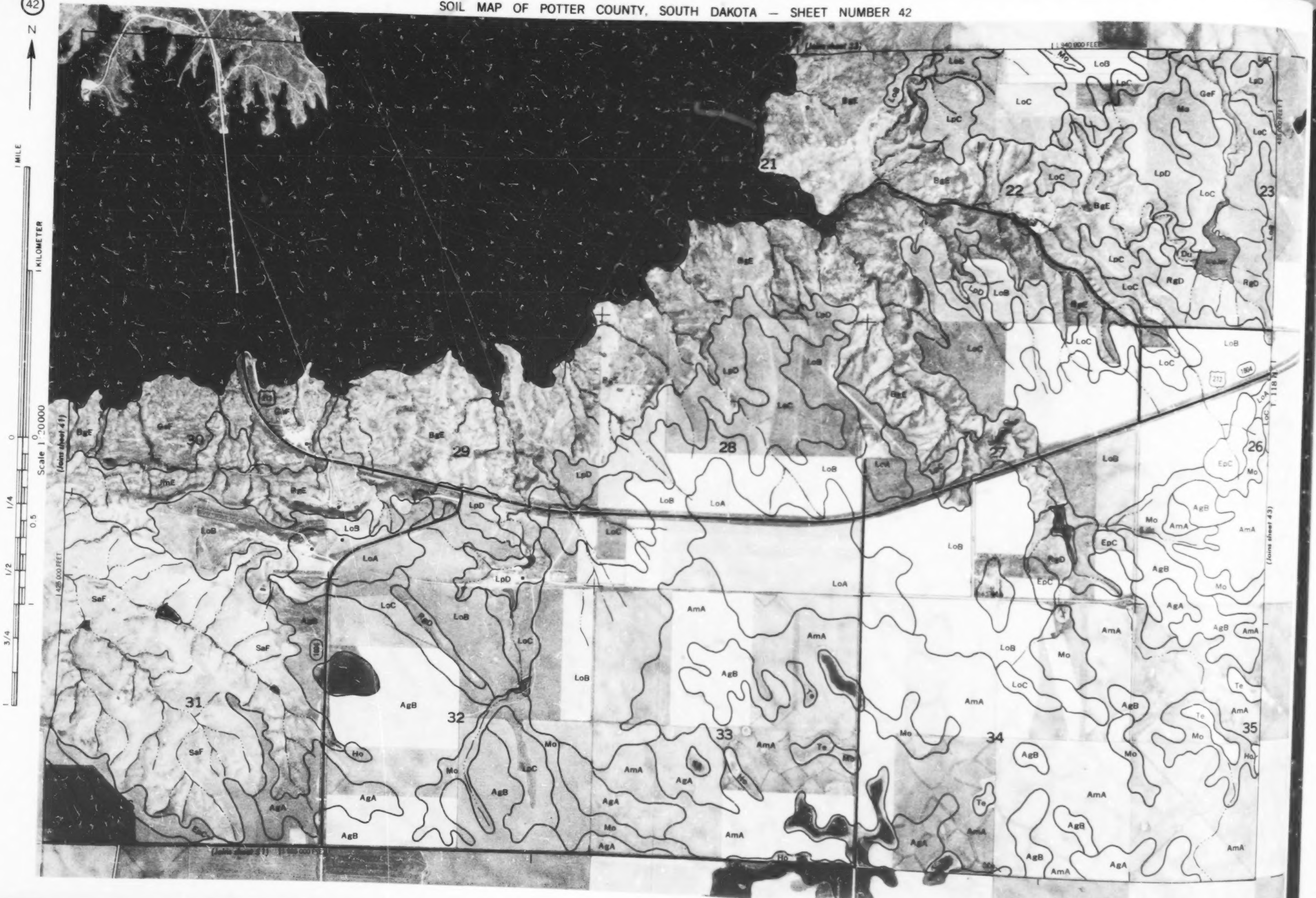
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 40


N
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
1
0
0.5
1
Scale 1:20000
(Joins sheet 39)
(Joins sheet 49)
(Joins sheet 39)
2 090 000 FEET
2 110 000 FEET
440 000 FEET
212
47
FAULK COUNTY
T. 118 N.
1
2
3
4
5
8
9
10
11
12
13
14
15
16
17
GlA
RaB
JbC
JgB
Pk
Te
GpB
GrA
GrB
BkE
Wo
CaA
Ho

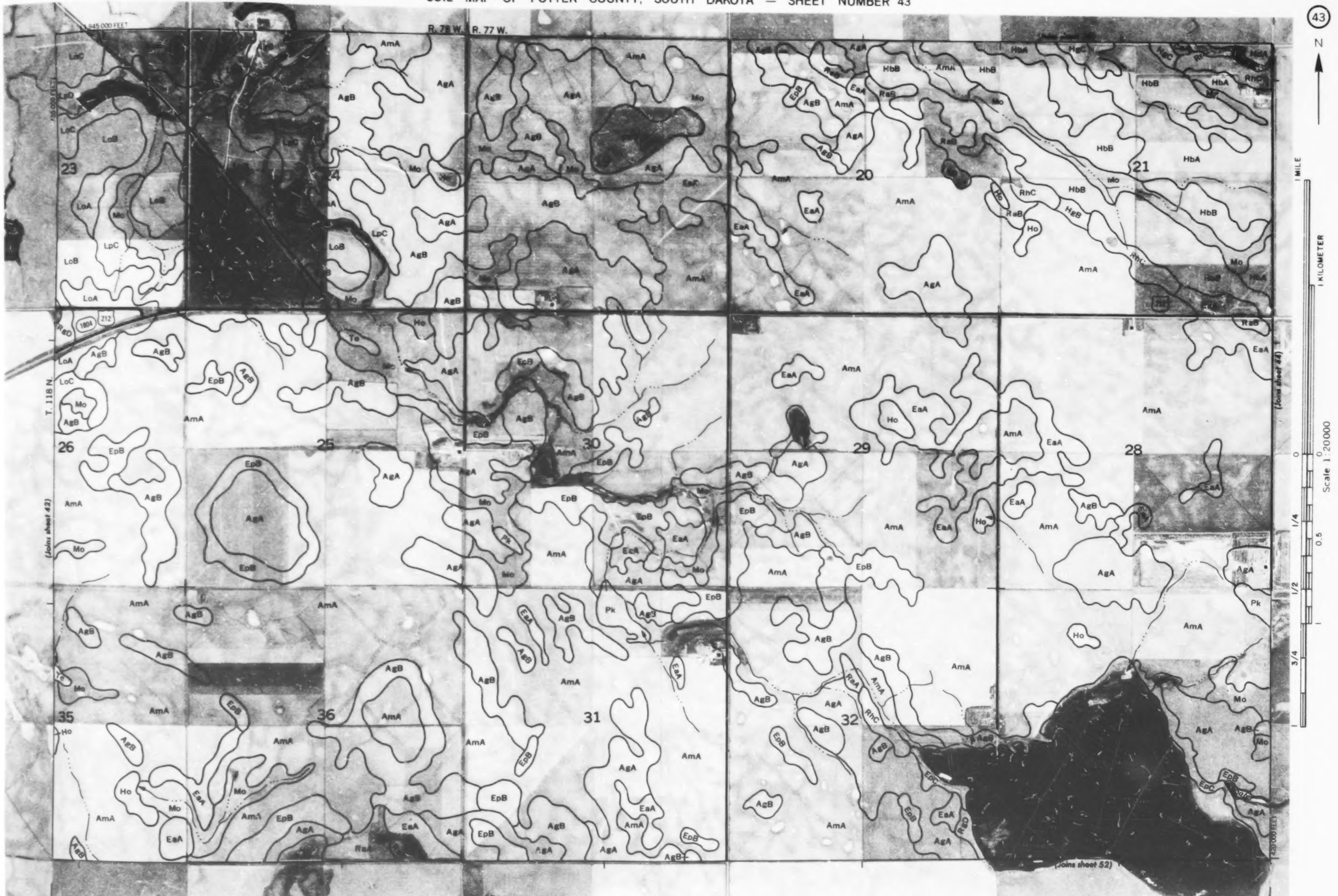
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 41


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
(Joins sheet 42)
(Joins sheet 50)
1 920 000 FEET
426 000 FEET
21
22
23
25
26
27
28
29
32
33
34
35
36
LoA
LoB
LoC
LoD
LpC
JmE
SaF
BgE
AgA
AgB
AmA
GaF
Mo
Te
Pa
CgE

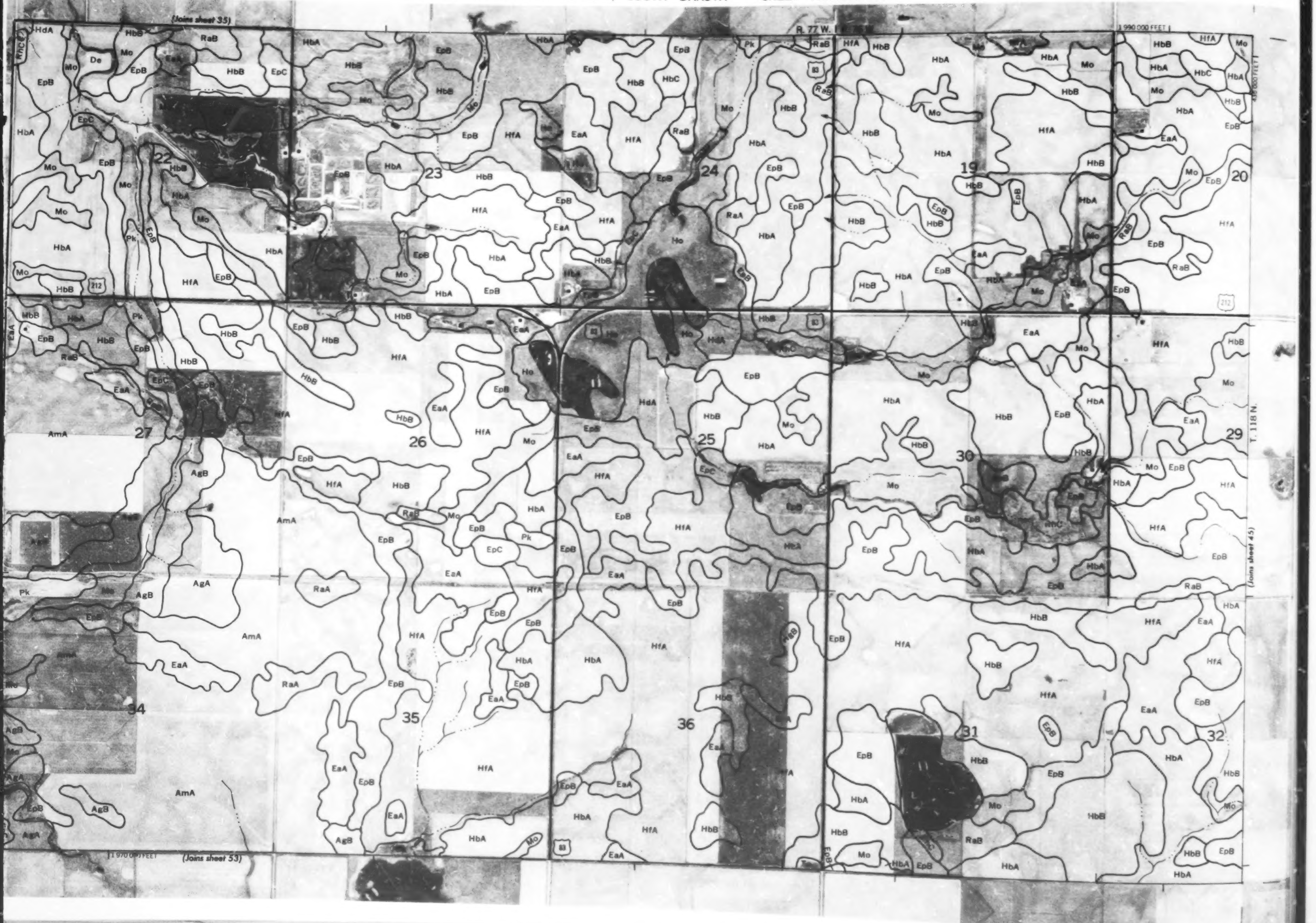
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 42


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
(Joins sheet 33)
1 340 000 FEET
(Joins sheet 41)
425 000 FEET
(Joins sheet 43)
(Joins sheet 51)
1 335 000 FEET
T. 118 N.
21
22
23
26
27
28
29
30
31
32
33
34
35
BgE
GeF
LoB
LoC
LoD
LoA
Mo
RgD
Du
EpC
AgB
AgA
AmA
Te
Ho
SaF
JmE
212
1804

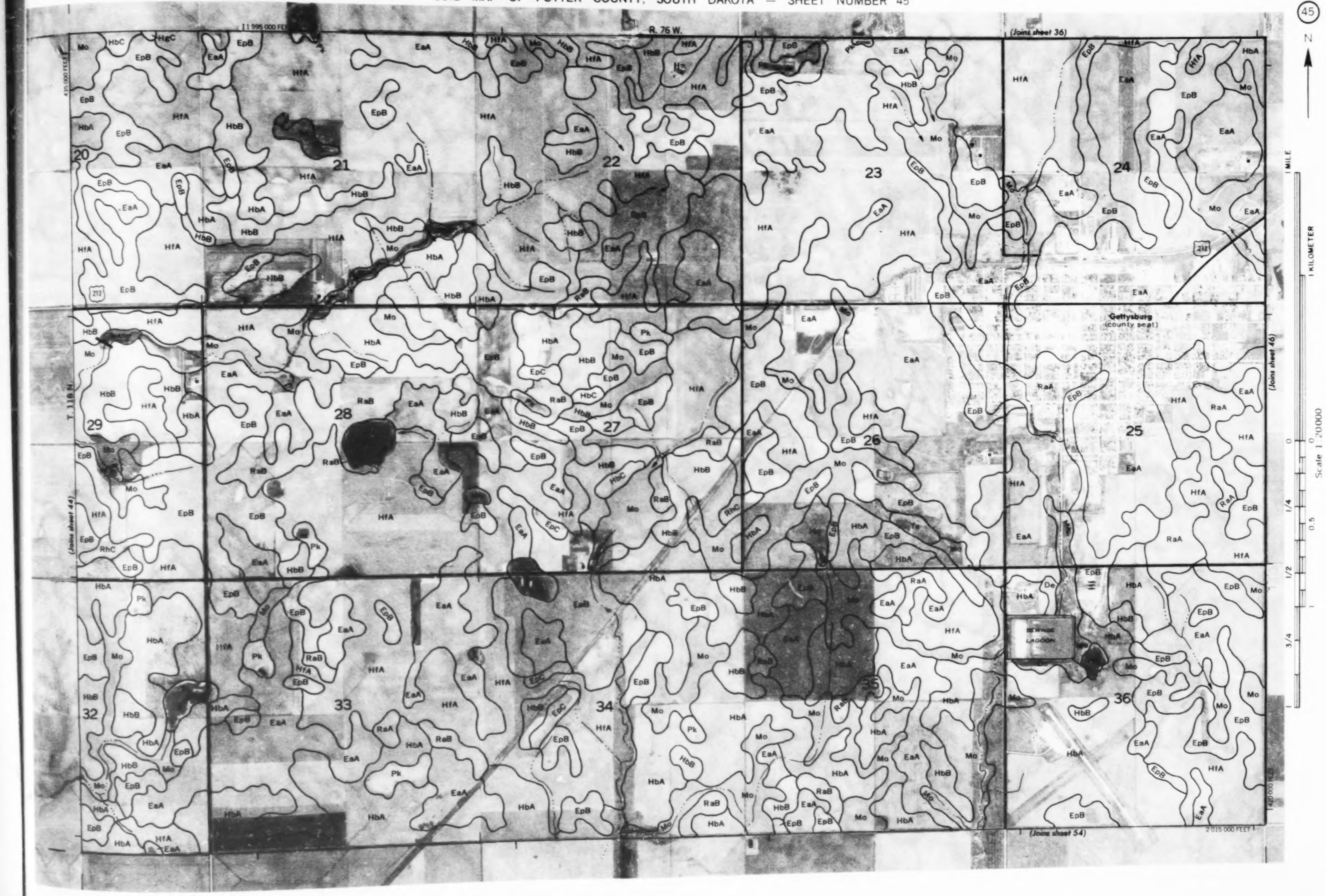
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 43


43
N
1 945 000 FEET
R. 78 W.
R. 77 W.
T. 118 N.
(Joins sheet 42)
(Joins sheet 44)
(Joins sheet 52)
1804
212
23
24
20
21
26
25
30
29
28
35
36
31
32
AmA
AgA
AgB
Mo
LoC
LoB
LoA
LpC
HbB
HbA
HgC
HgB
RhC
RaB
RaA
ReD
EaA
EpB
EpC
Ho
Te
Pk
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
0.5
Scale 1:20000

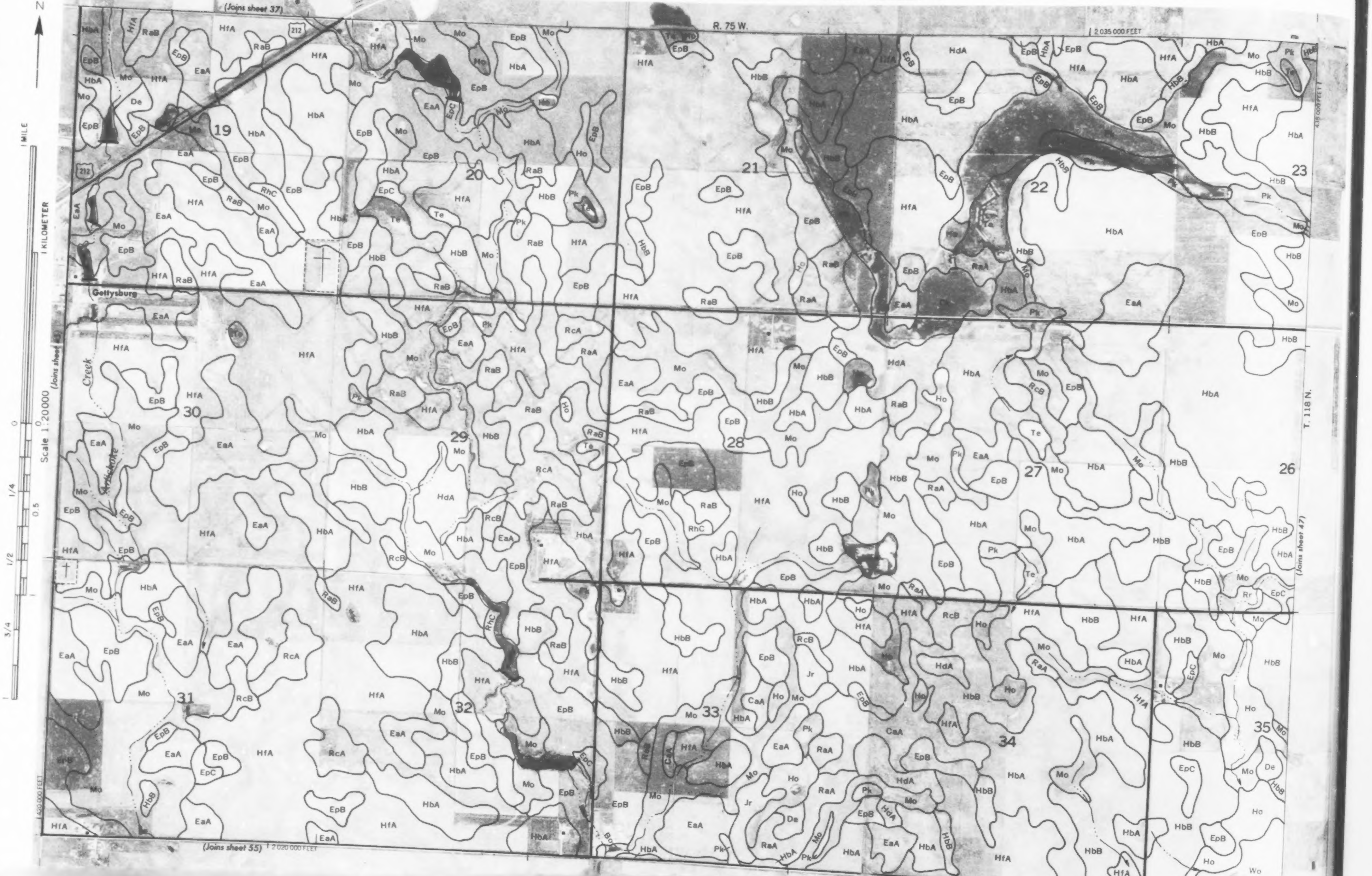
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 44


(Joins sheet 35)
R. 77 W. | R. 76 W.
1 990 000 FEET
430 000 FEET
T. 118 N.
(Joins sheet 45)
1 970 000 FEET
(Joins sheet 53)
22
23
24
19
20
27
26
25
30
29
34
35
36
31
32
212
83
HdA
HbB
RaB
De
Mo
EpB
EaA
HbB
EpC
HbA
HbC
EpB
HfA
Ho
Pk
AmA
AgB
AgA
RaA
HdA
EpC
HfA
RaB
RhC

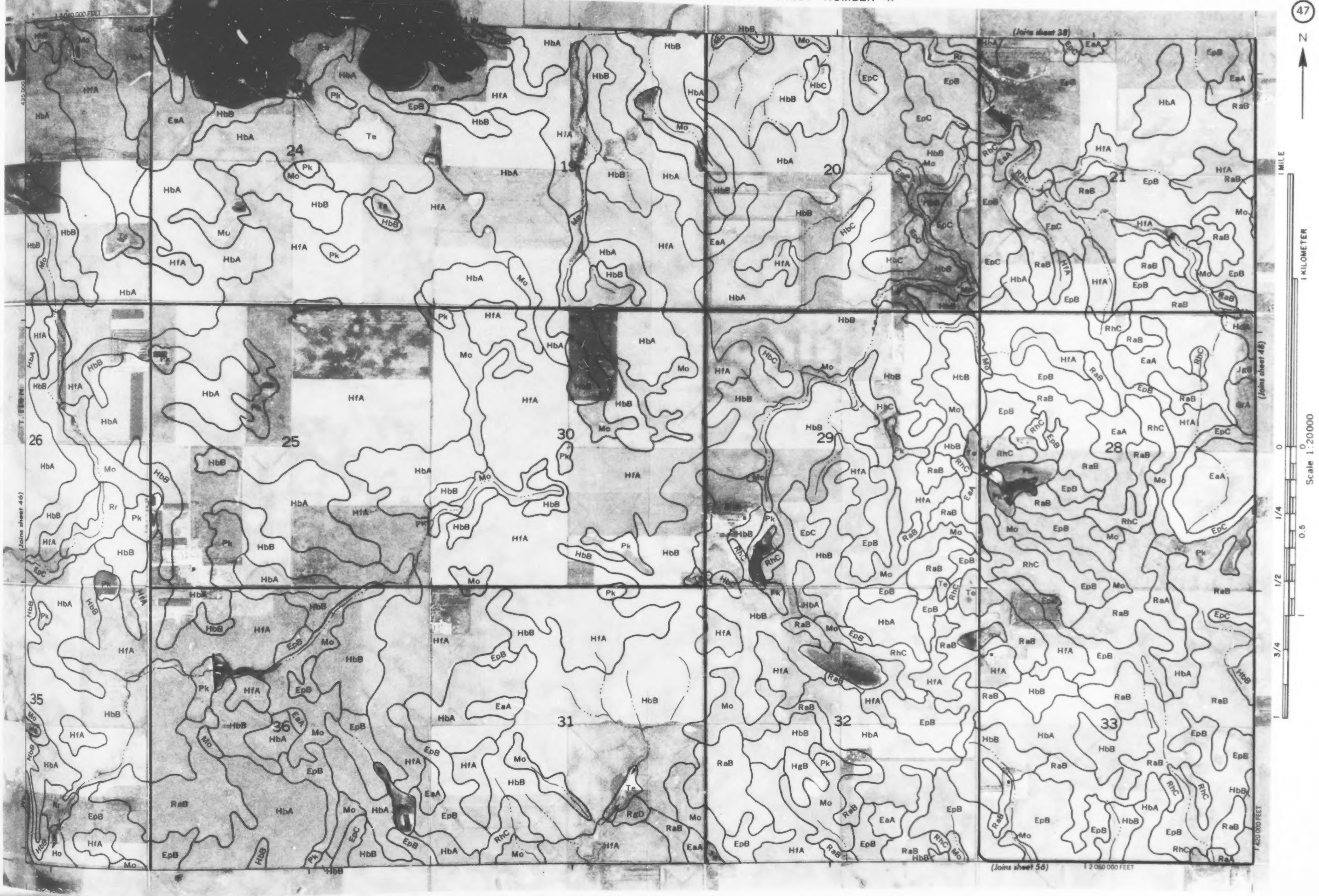
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 45


1 995 000 FEET
R. 76 W.
(Joins sheet 36)
435 000 FEET
T. 118 N.
(Joins sheet 44)
(Joins sheet 46)
(Joins sheet 54)
2 015 000 FEET
420 000 FEET
Gettysburg
(county seat)
SEWAGE LAGOON
212
20
21
22
23
24
25
26
27
28
29
32
33
34
35
36
N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
0.5
EaA
EpB
EpC
HbA
HbB
HbC
HfA
Mo
Pk
RaA
RaB
RhC
De

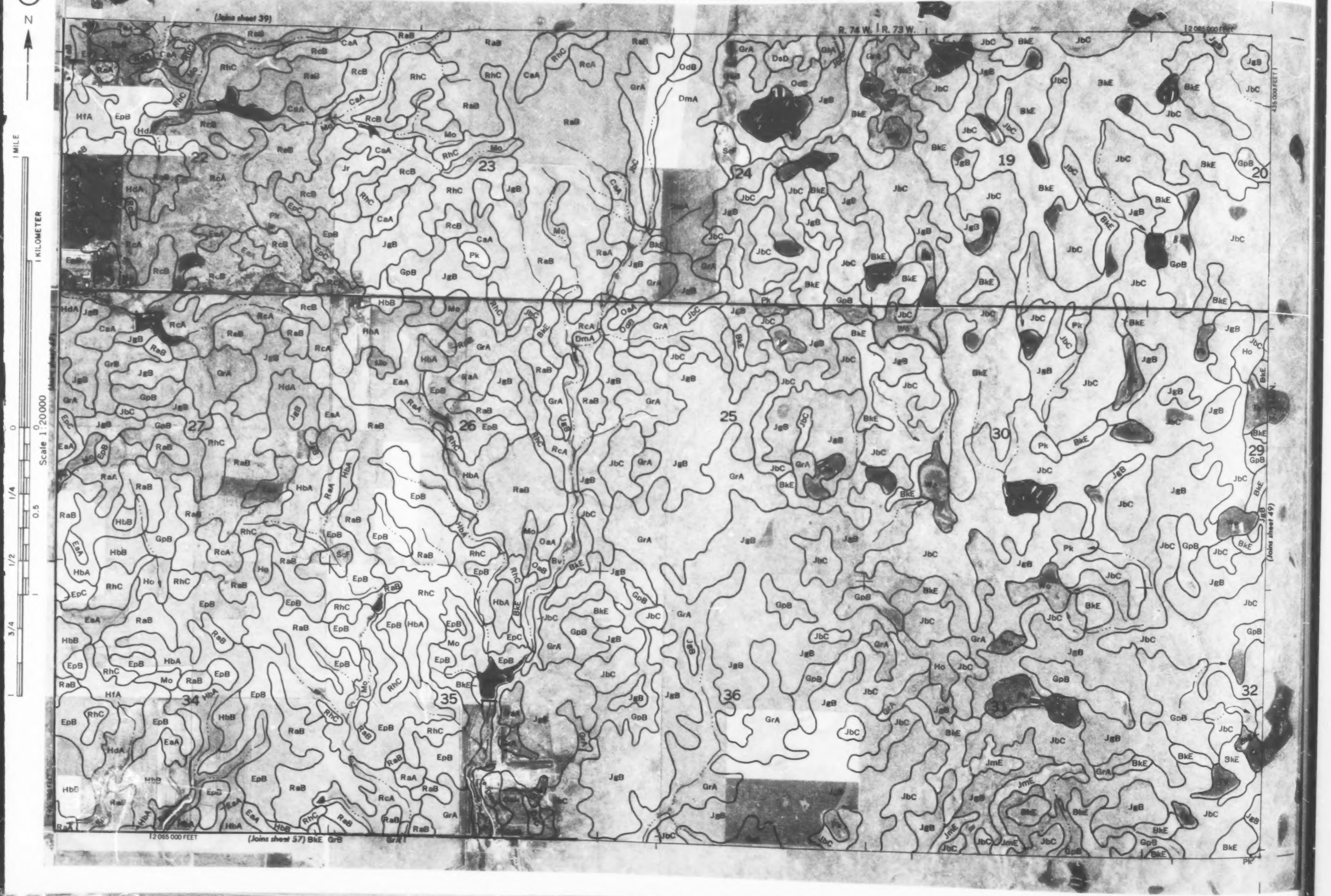
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 46


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
(Joins sheet 37)
(Joins sheet 45)
(Joins sheet 47)
(Joins sheet 55)
R. 75 W.
T. 118 N.
2 035 000 FEET
2 020 000 FEET
435 000 FEET
420 000 FEET
212
Gettysburg
Artichoke Creek
19
20
21
22
23
26
27
28
29
30
31
32
33
34
35

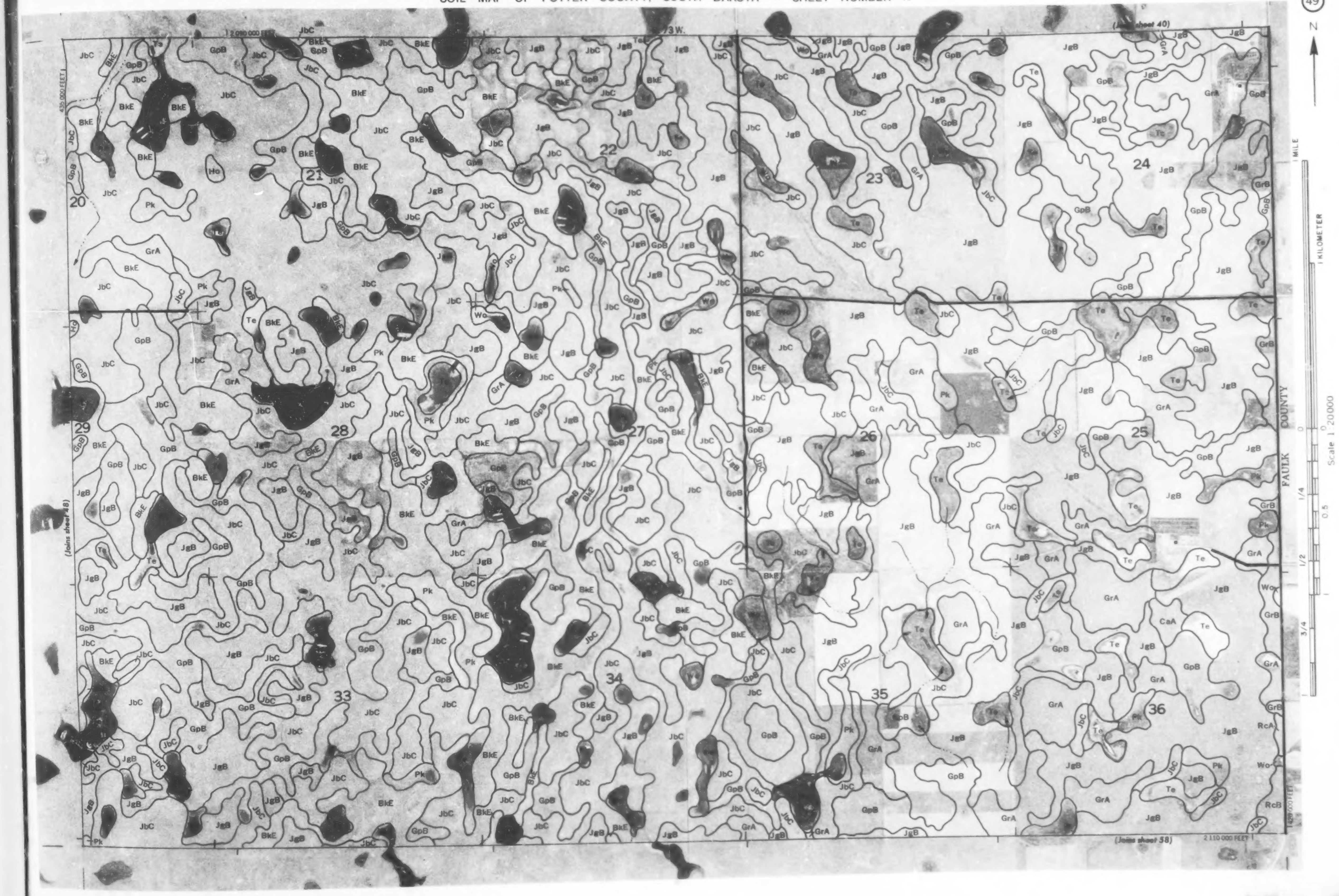
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 47


47
N
(Joins sheet 38)
(Joins sheet 48)
(Joins sheet 56)
(Joins sheet 46)
1 960 000 FEET
2 060 000 FEET
420 000 FEET
435 000
T. 119 N.
74 W.
24
19
20
21
26
25
30
29
28
35
36
31
32
33
Scale 1:20000
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
1
0.5
HbA
HbB
HbC
HfA
EaA
EpB
EpC
Mo
Pk
Te
RaB
RaA
RhC
Rr
RgD
HgB
JgB
Ho
De
Be

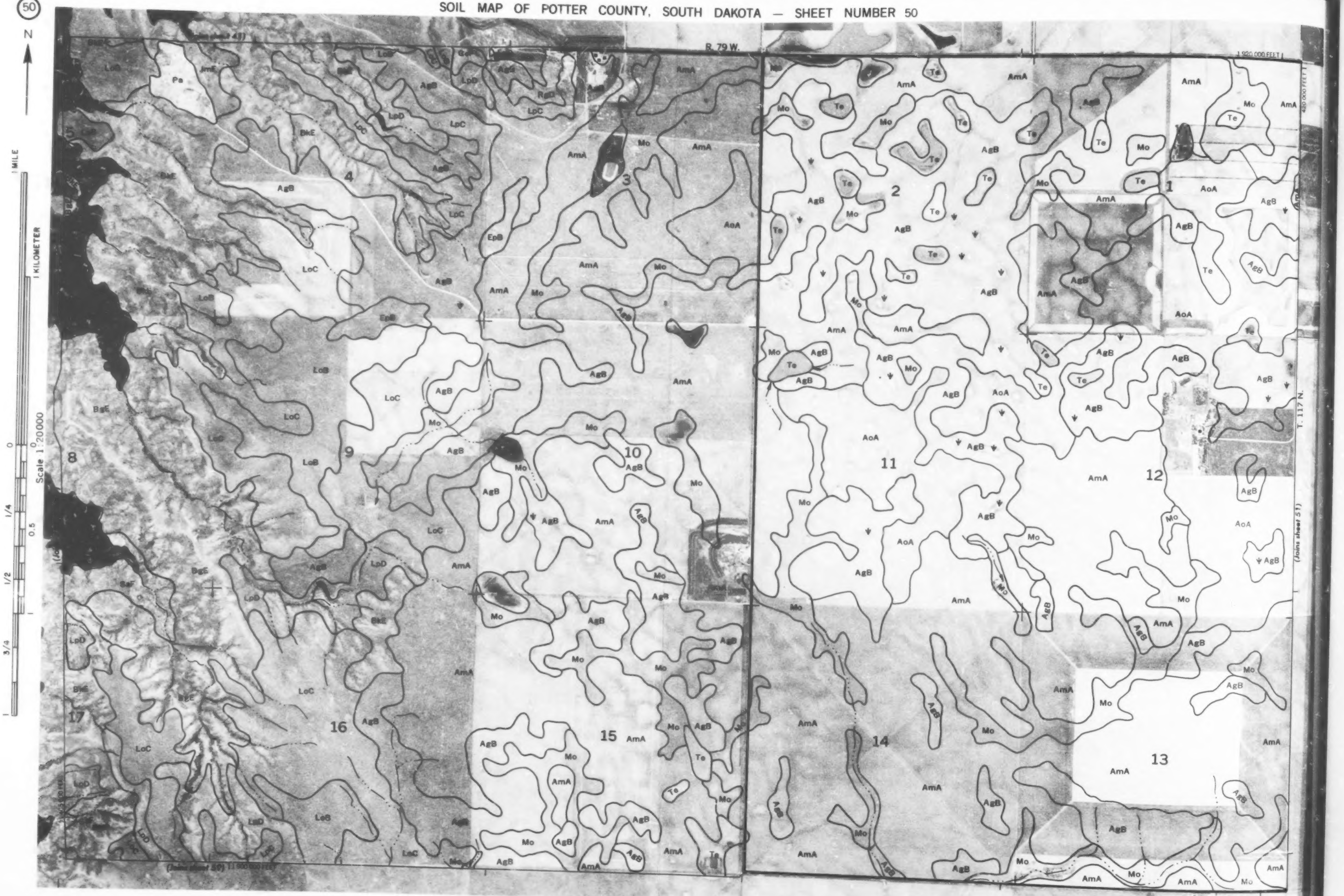
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 48


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
(Joins sheet 39)
(Joins sheet 47)
(Joins sheet 49)
(Joins sheet 57)
R. 74 W.
R. 73 W.
2 065 000 FEET
435 000 FEET
19
20
22
23
24
25
26
27
29
30
31
32
34
35
36

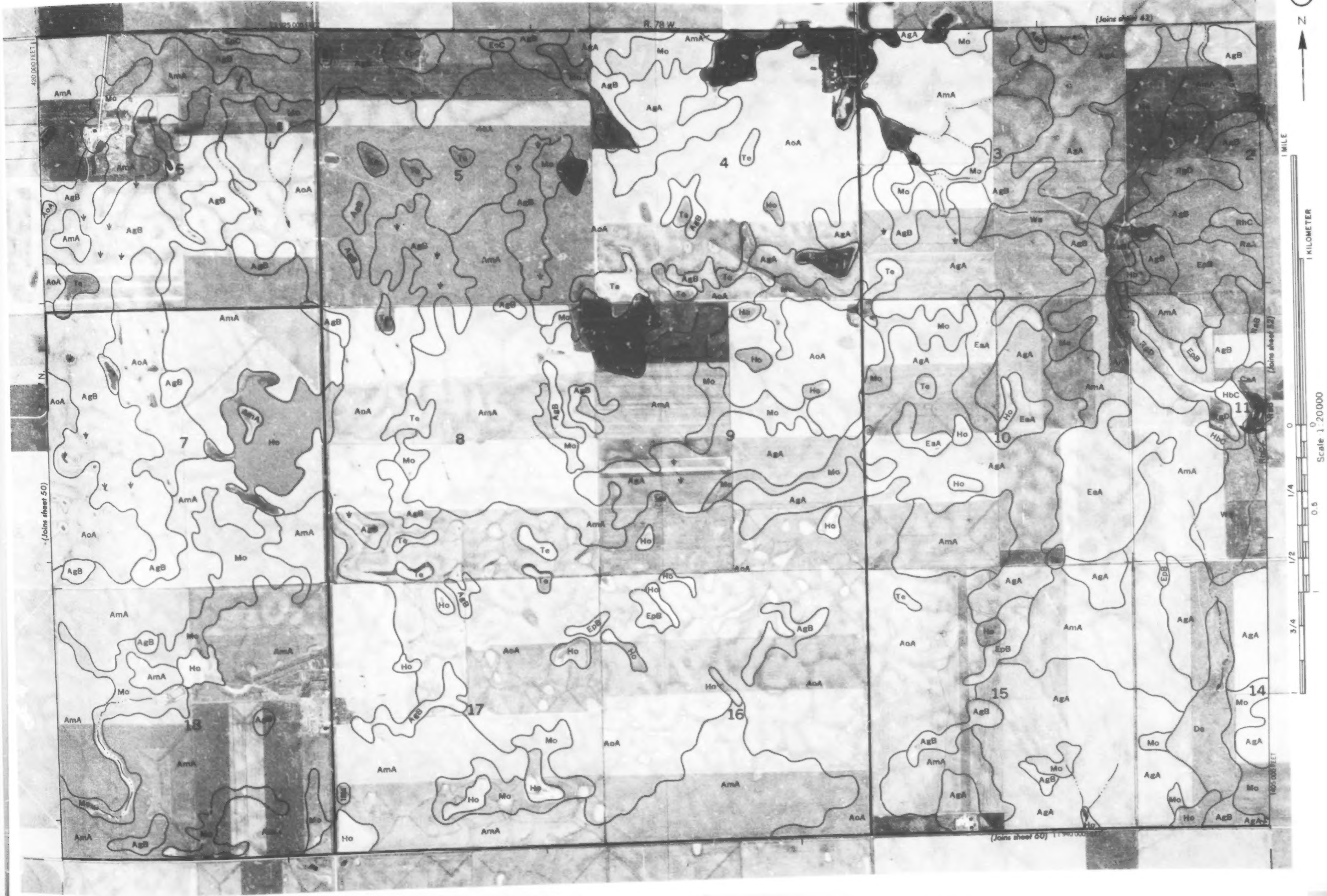
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 49


R. 73 W.
2 090 000 FEET
435 000 FEET
(Joins sheet 40)
(Joins sheet 48)
(Joins sheet 58)
2 110 000 FEET
410 000 FEET
20
21
22
23
24
25
26
27
28
29
33
34
35
36
FAULK COUNTY
N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1

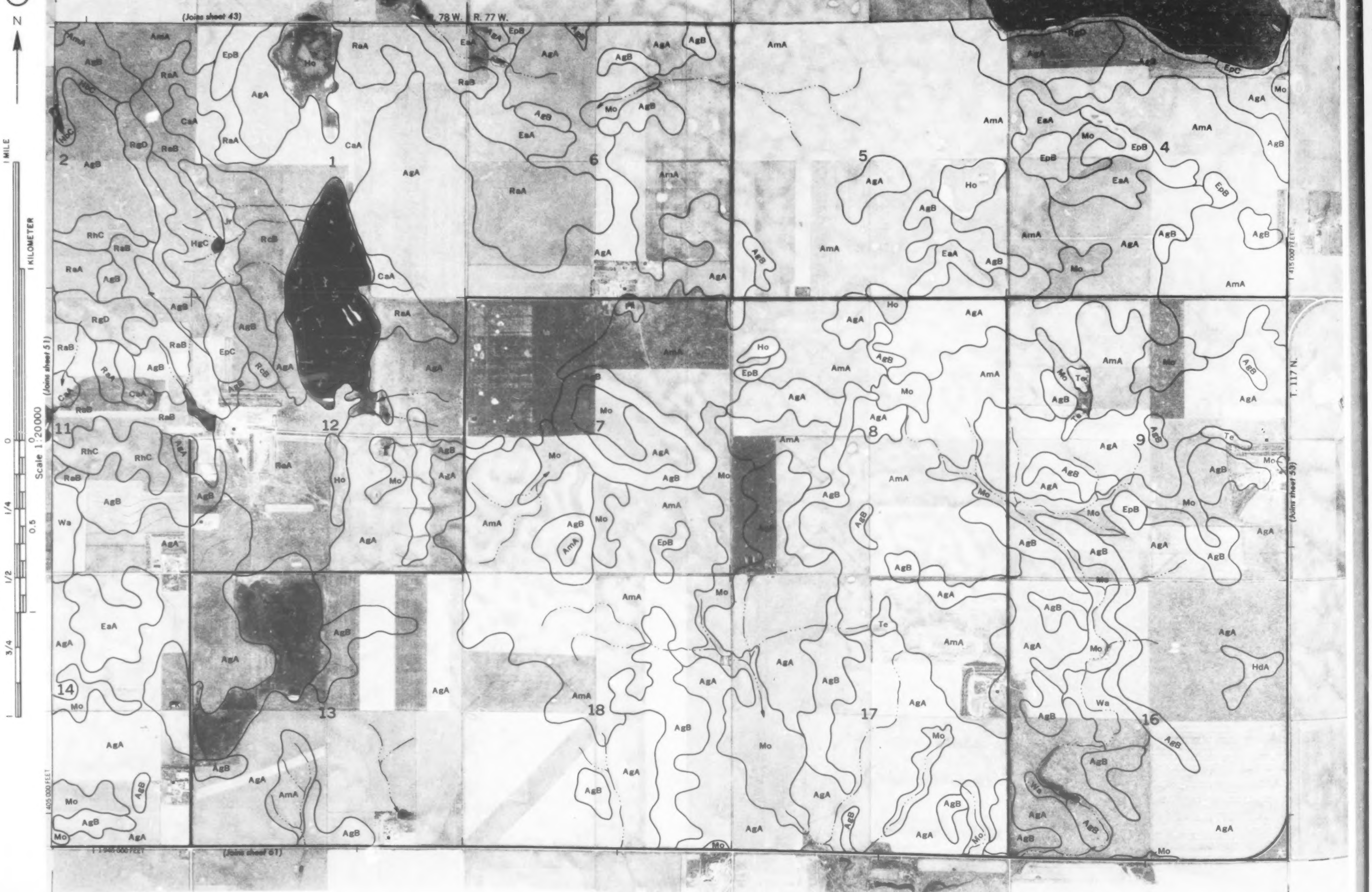
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 50


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
R. 79 W.
T. 117 N.
1 920 000 FEET
420 000 FEET
(Joins sheet 43)
(Joins sheet 51)
(Joins sheet 58)
1 900 000 FEET
1
2
3
4
5
8
9
10
11
12
13
14
15
16
17
AgB
AmA
AoA
BgE
BkE
EpB
GeB
JmE
LoB
LoC
LoD
LpC
LpD
Mo
Pa
RgD
SaF
Te

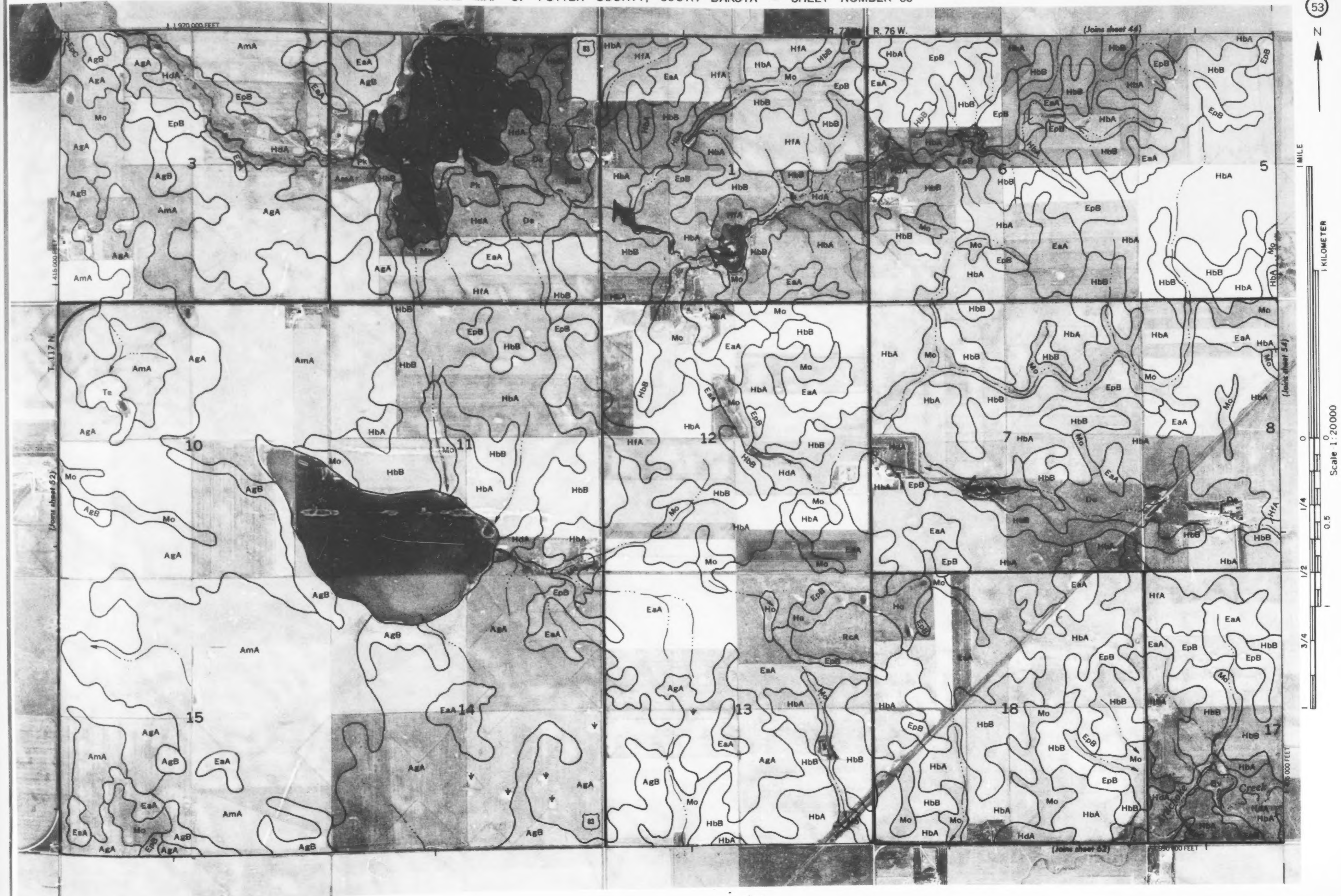
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 51


(Joins sheet 42)
(Joins sheet 50)
(Joins sheet 52)
(Joins sheet 60)
R. 78 W.
N.
420 000 FEET
1 940 000 FEET
1 925 000 FEET
405 000 FEET
N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0.5
2
3
4
5
7
8
9
10
11
14
15
16
17
18
AgA
AgB
AmA
AoA
Ho
Mo
Te
EaA
EoC
EpB
HbC
RhC
RaD
De
We

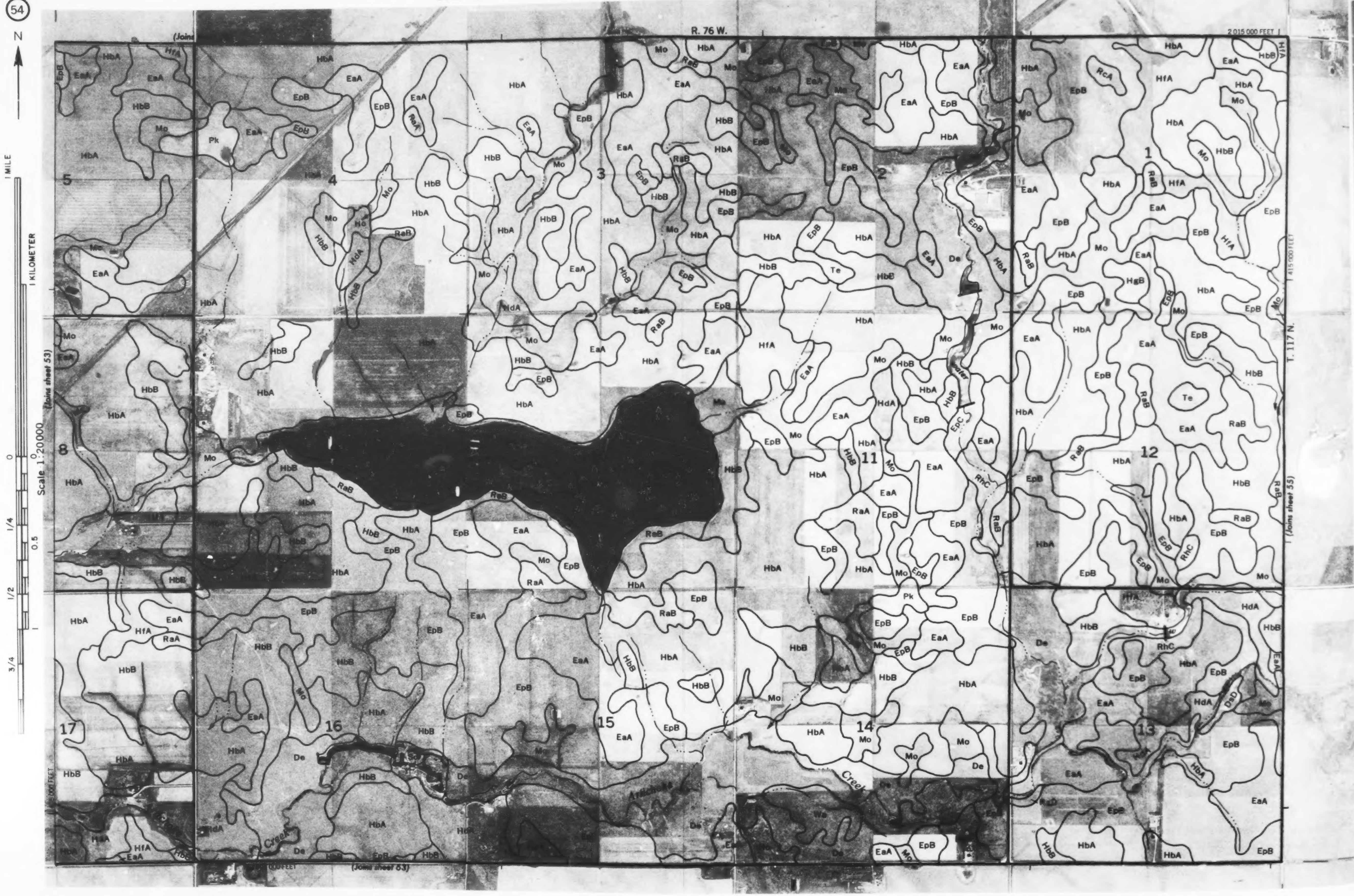
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 52


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
(Joins sheet 43)
R. 78 W.
R. 77 W.
(Joins sheet 51)
(Joins sheet 53)
(Joins sheet 61)
T. 117 N.
1 415 000 FEET
1 405 000 FEET
1 1 940 000 FEET
1
2
3
4
5
6
7
8
9
11
12
13
14
16
17
18
AmA
AgB
AgA
RaA
RaB
RgD
CaA
EpB
EpC
Ho
Mo
HgC
RhC
RcB
Jr
EaA
Te
Wa
HdA
ReB

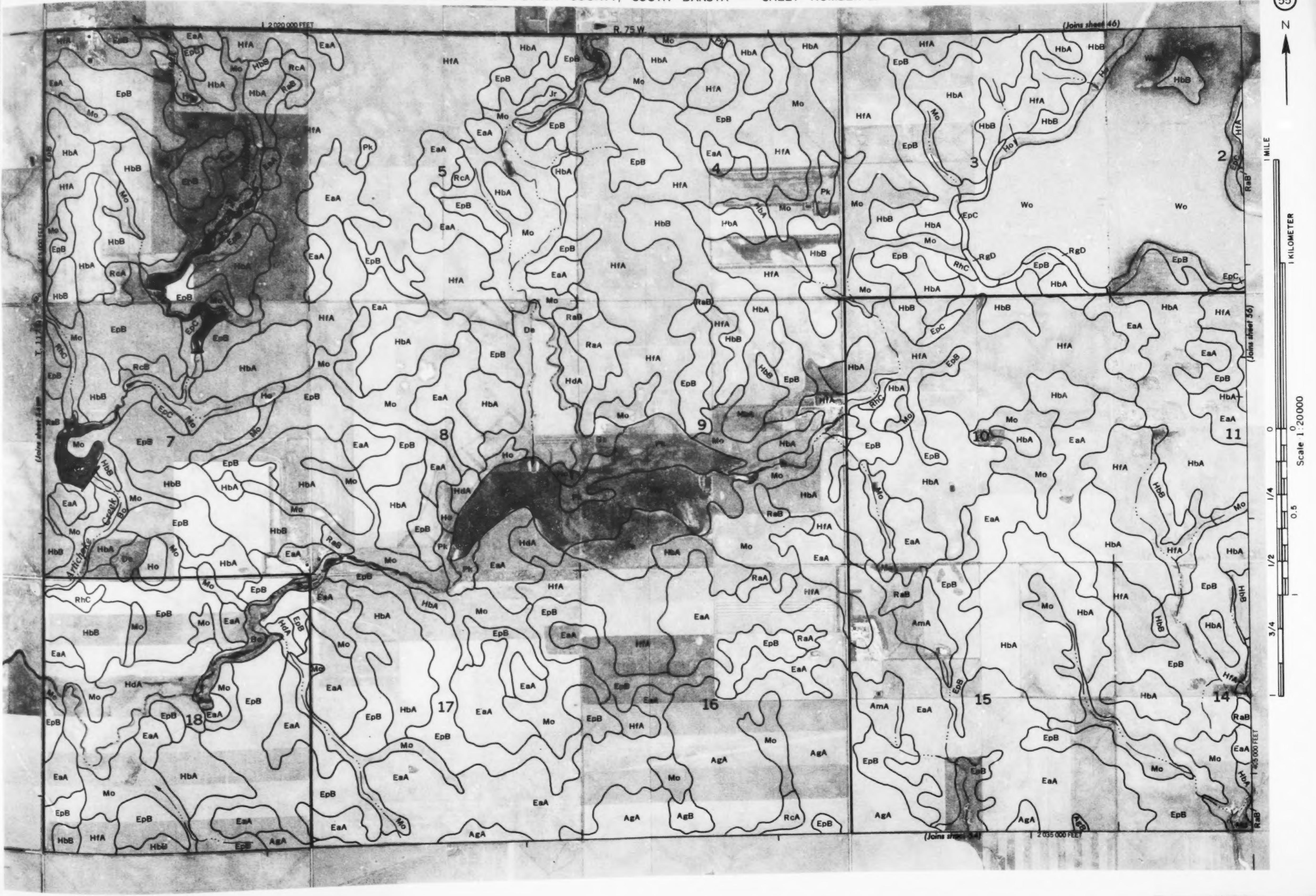
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 53


1 970 000 FEET
R. 77 W.
R. 76 W.
(Joins sheet 44)
(Joins sheet 54)
(Joins sheet 52)
(Joins sheet 62)
T. 117 N.
415 000 FEET
1 950 000 FEET
N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
3
1
6
5
10
11
12
7
8
15
14
13
18
17
83
Artichoke Creek
AgA
AgB
AmA
De
EaA
EpB
EpC
HbA
HbB
HdA
HfA
Ho
Mo
Pk
RcA
Sv
Te

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 54

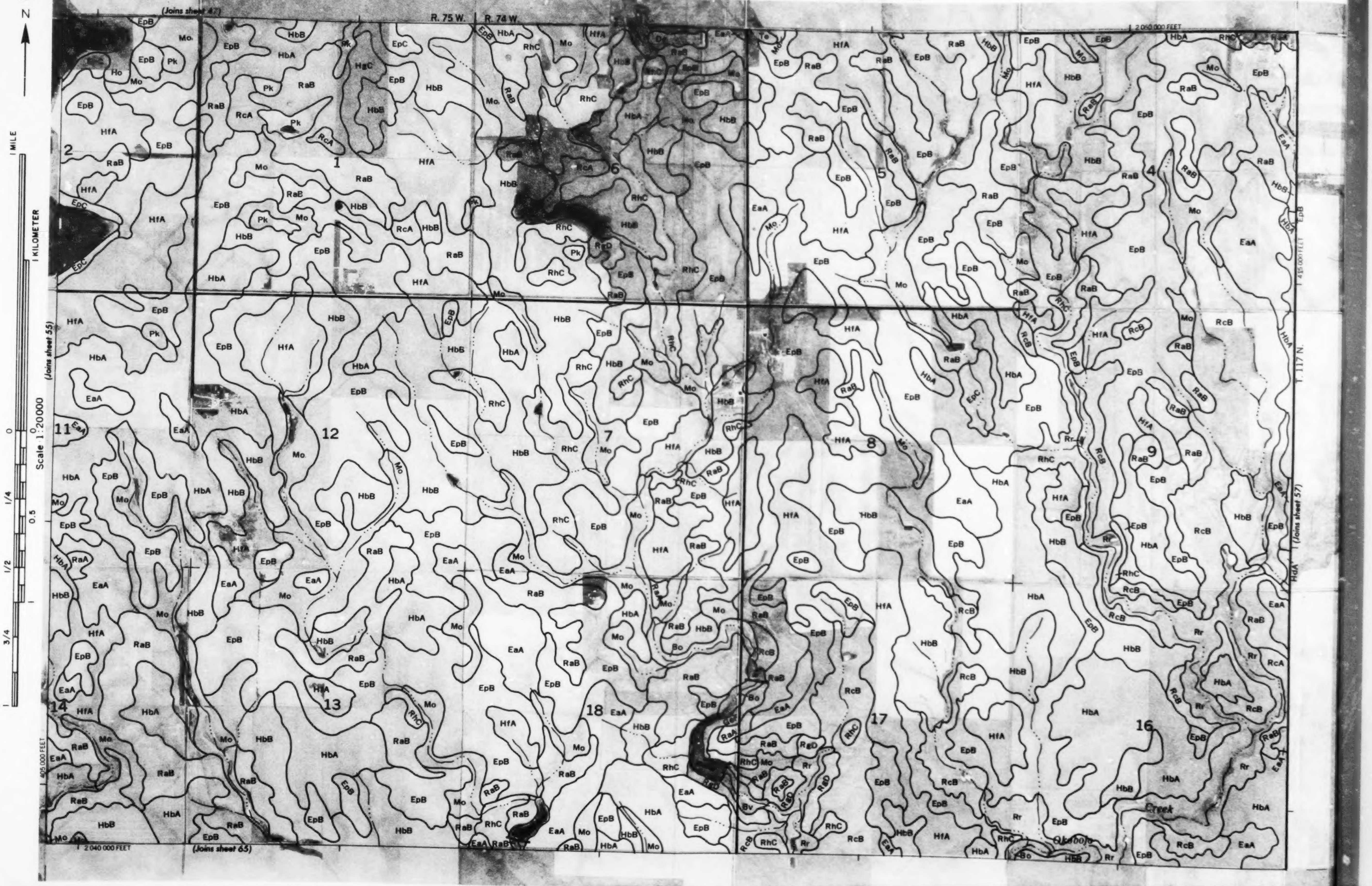

54
N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
0
0.5
R. 76 W.
T. 117 N.
2 015 000 FEET
415 000 FEET
(Joins sheet 53)
(Joins sheet 55)
(Joins sheet 53)
1
2
3
4
5
8
11
12
13
14
15
16
17
Artichoke
Creek
Creek

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 55

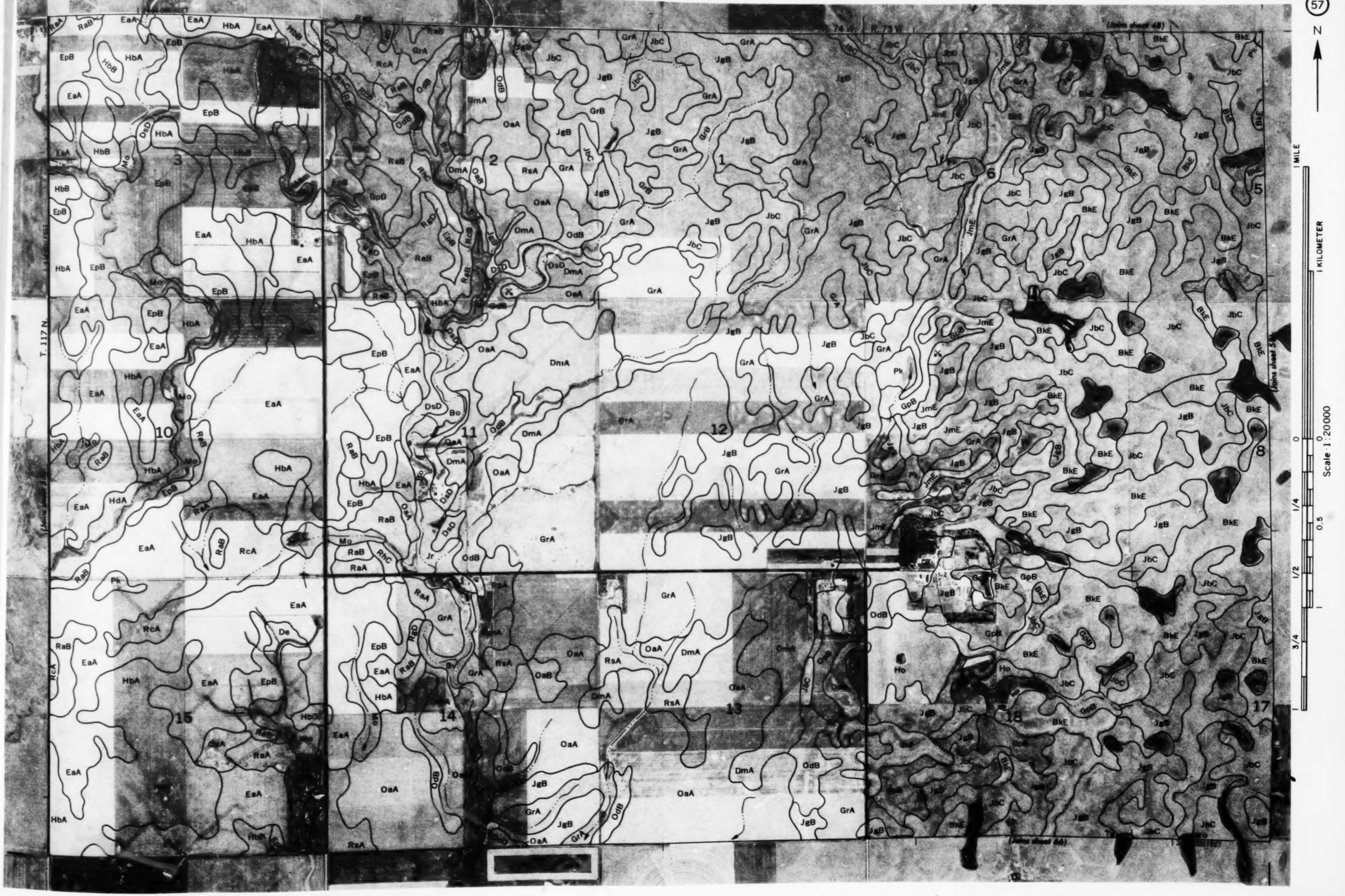

1 2 020 000 FEET
R. 75 W.
(Joins sheet 46)
(Joins sheet 56)
(Joins sheet 54)
(Joins sheet 64)
T. 117 N.
1 2 035 000 FEET
Artichoke Creek
2
3
4
5
7
8
9
10
11
14
15
16
17
18
N
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
1
0.5
Scale 1:20000

56

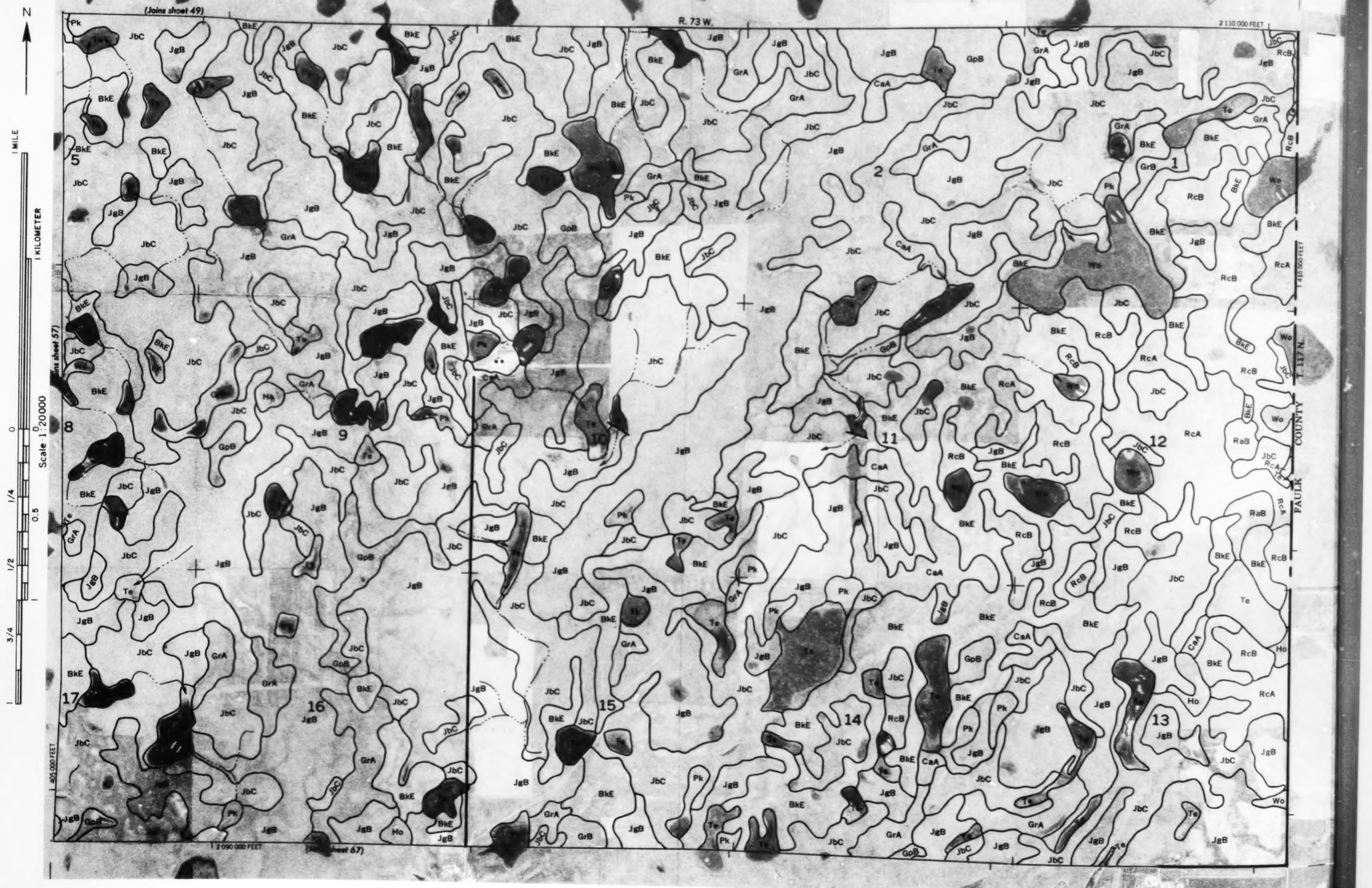
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 56


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
(Joins sheet 47)
R. 75 W.
R. 74 W.
2 050 000 FEET
(Joins sheet 55)
(Joins sheet 57)
T. 117 N.
415 000 FEET
405 000 FEET
2 040 000 FEET
(Joins sheet 65)
1
2
4
5
6
7
8
9
11
12
13
14
16
17
18
Okobojo
Creek

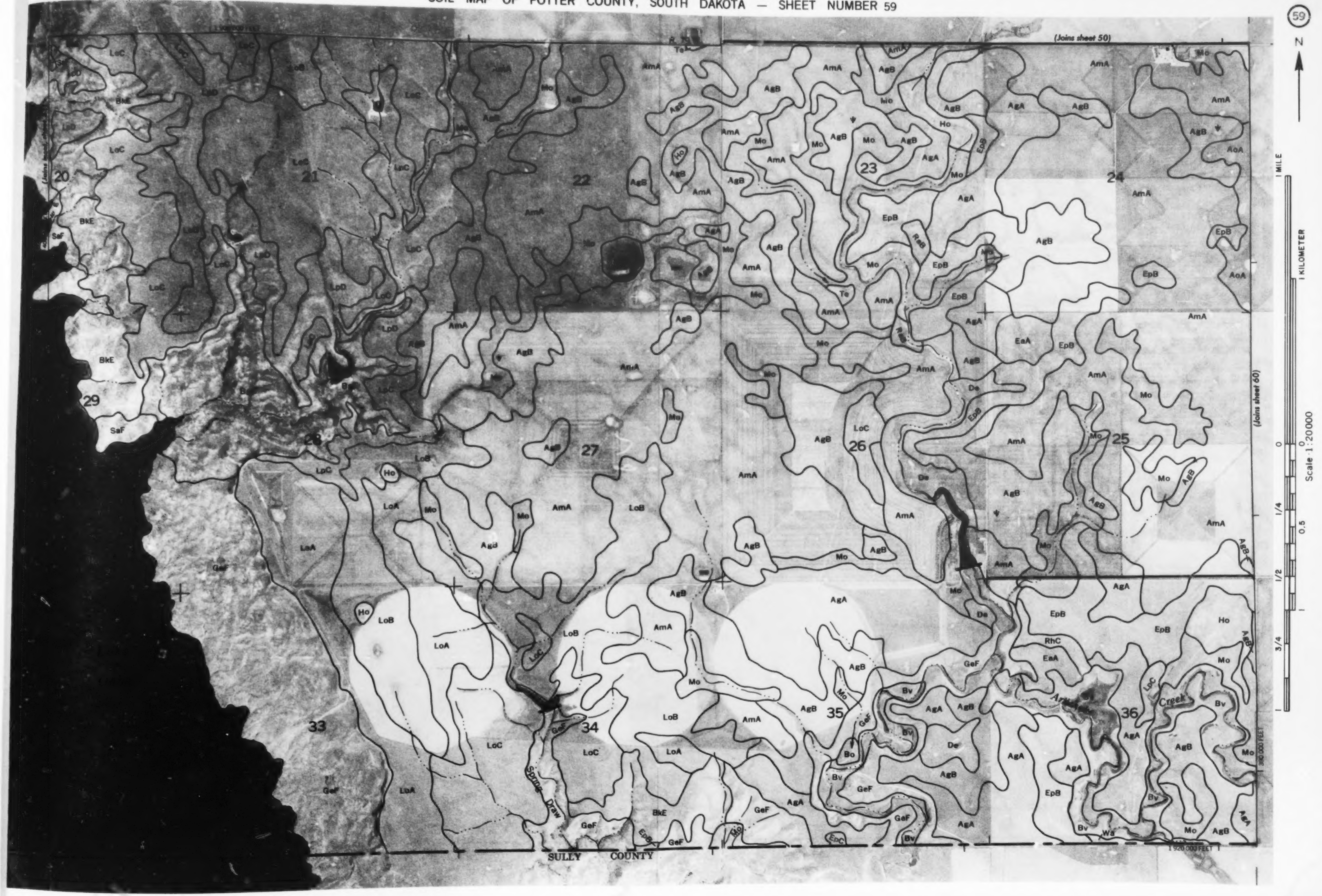
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 57


N
(Joins sheet 48)
(Joins sheet 58)
(Joins sheet 66)
R. 74 W.
R. 73 W.
T. 117 N.
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
2
3
5
6
8
10
11
12
13
14
15
17
18
EaA
EpB
HbA
HbB
RaB
RcA
GrA
JbC
JgB
BkE
JmE
OaA
OdB
DmA
DsD
GpB
Pk
Mo
Ho
RsA
RhC
Bo
De

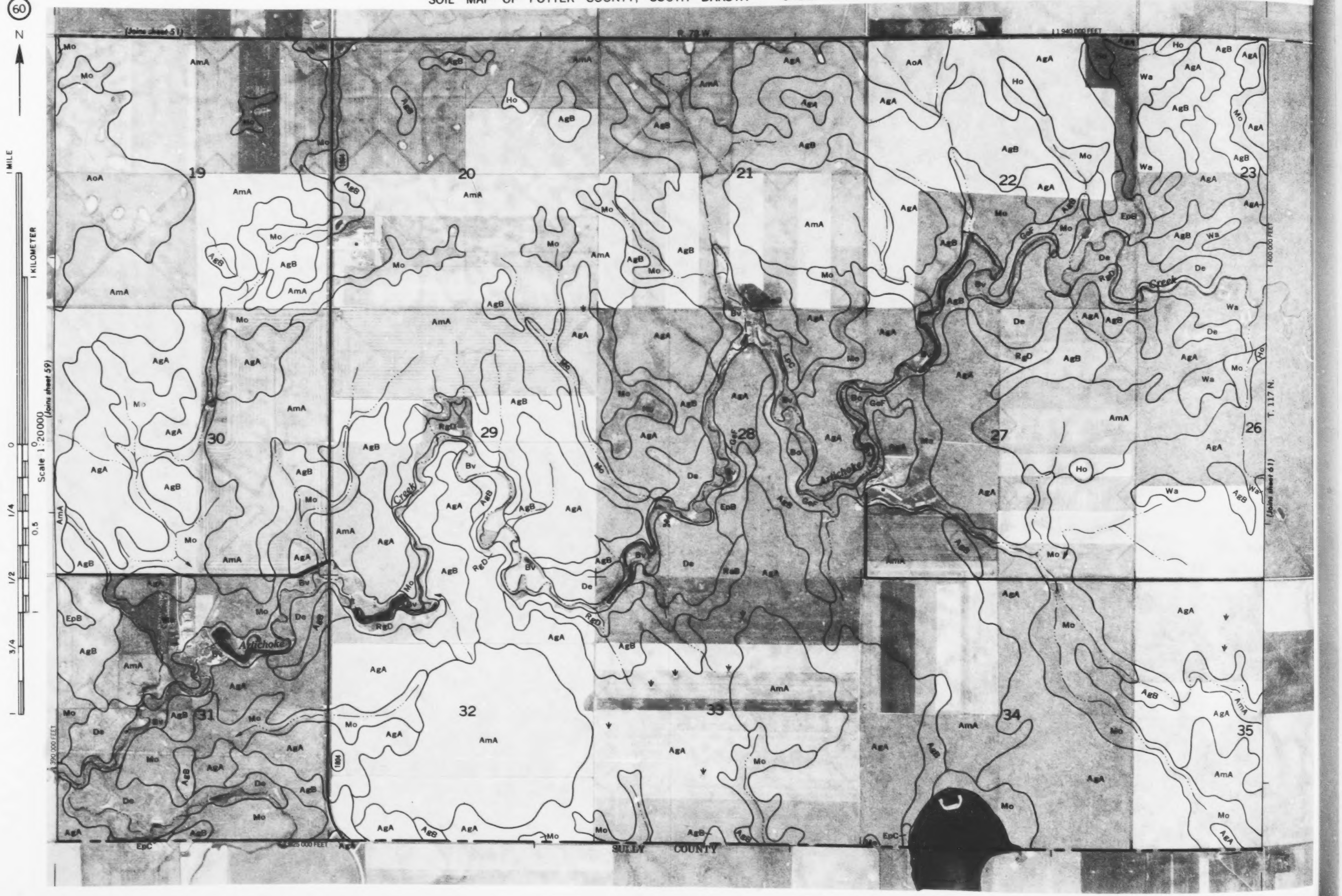
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 58


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
0.5
1/2
3/4
1
(Joins sheet 49)
R. 73 W.
2 110 000 FEET
1 415 000 FEET
T. 117 N.
FAULK COUNTY
(Joins sheet 57)
405 000 FEET
2 090 000 FEET
(Joins sheet 67)
1
2
5
8
9
10
11
12
13
14
15
16
17
BkE
CaA
GpB
GrA
GrB
Ho
JbC
JgB
Pk
RaB
RcA
RcB
Te
Wo

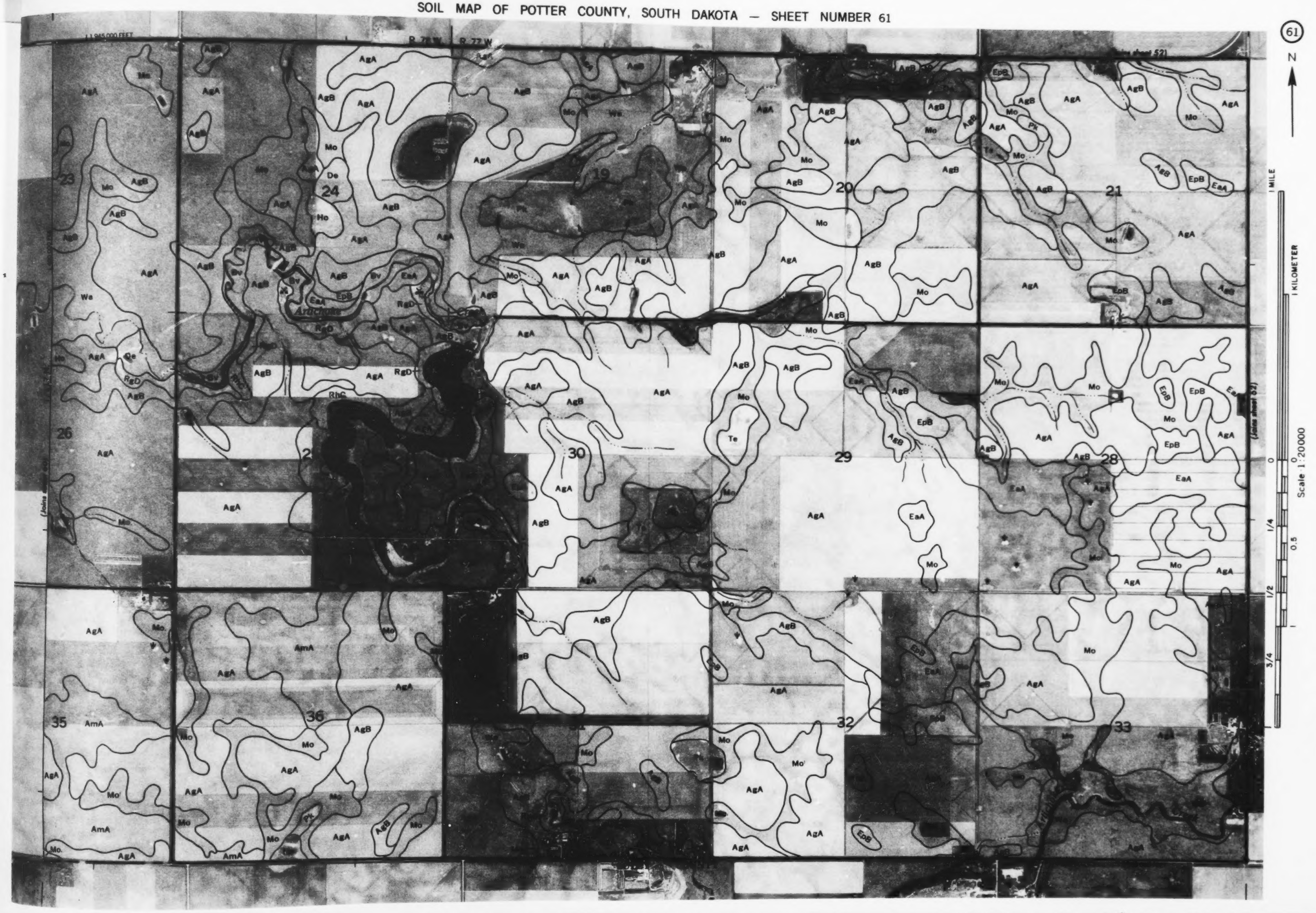
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 59


59
N
(Joins sheet 50)
(Joins sheet 60)
SULLY COUNTY
1 920 000 FEET
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
0.5
Scale 1:20000
20
21
22
23
24
25
26
27
28
29
33
34
35
36
Spring Draw
Creek
AmA
AgA
AgB
AoA
Mo
Ho
EpB
EaA
De
LoA
LoB
LoC
LoD
BkE
SaF
GeF
Bv
Bo
RhC
ReB
Te
Wa
EpC

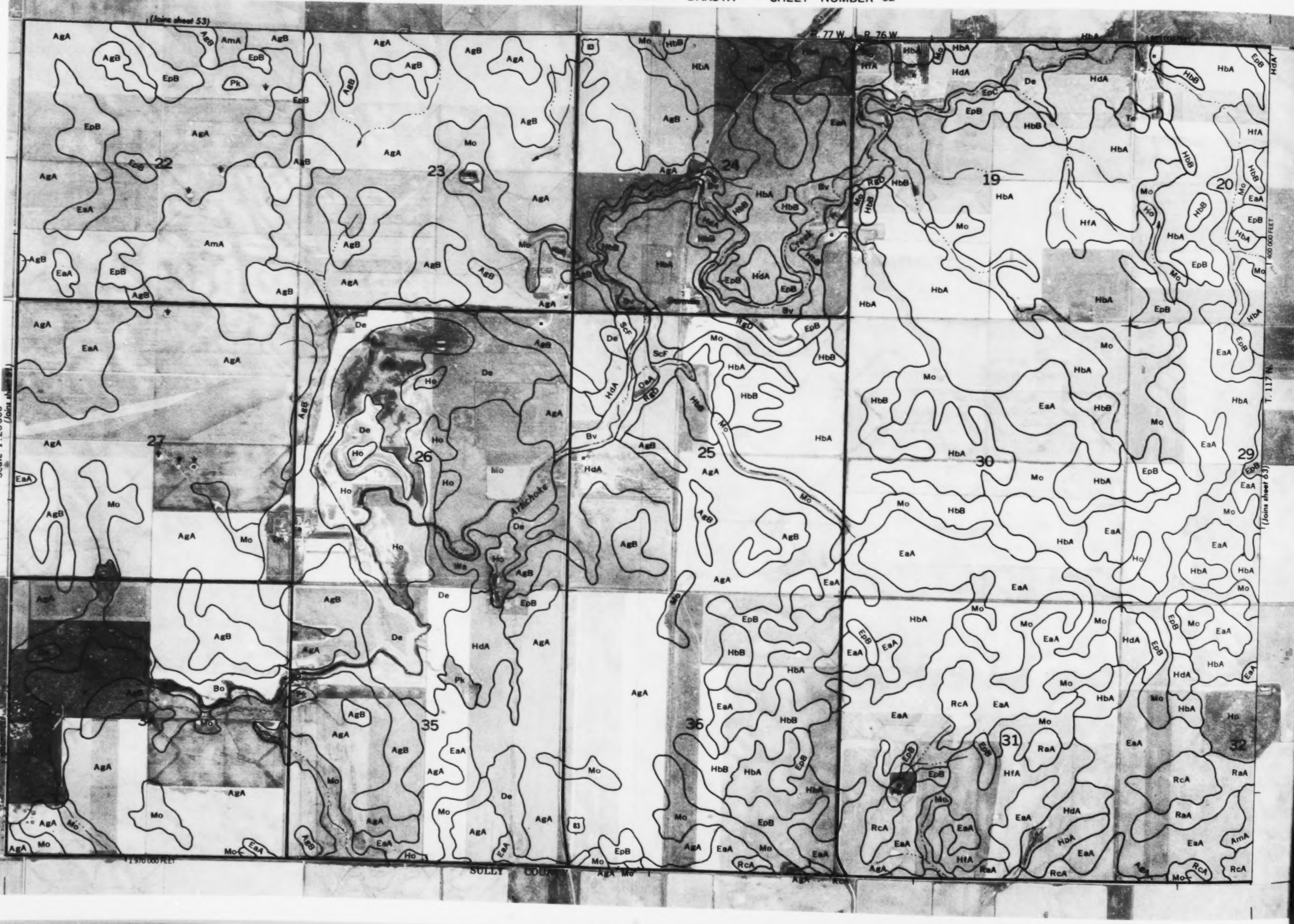
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 60


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
(Joins sheet 51)
(Joins sheet 59)
(Joins sheet 61)
R. 78 W.
T. 117 N.
1 940 000 FEET
1 400 000 FEET
1 390 000 FEET
1 825 000 FEET
SULLY COUNTY
Artichoke
Creek
19
20
21
22
23
26
27
28
29
30
31
32
33
34
35
1804

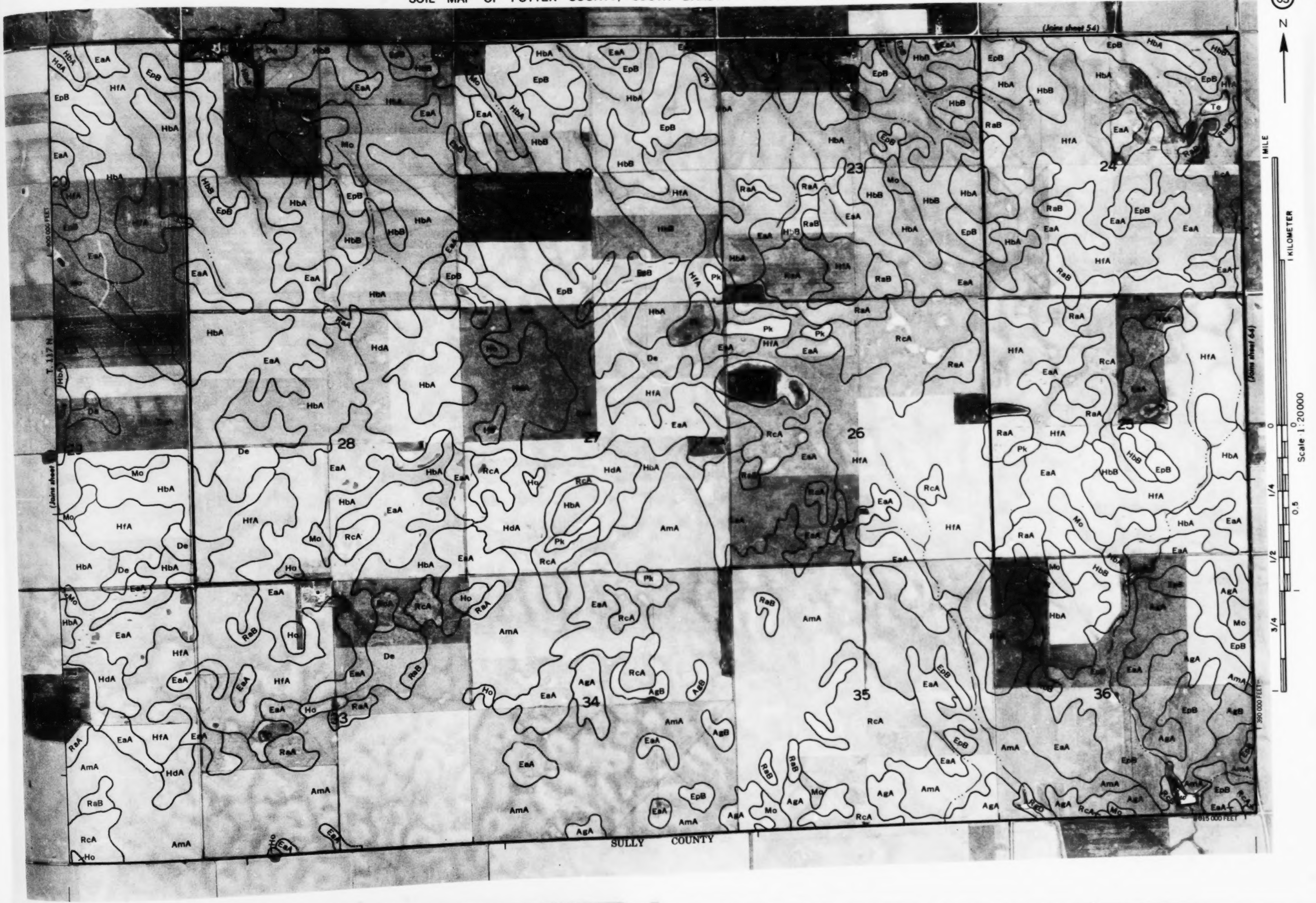
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 61


61
N
1 945 000 FEET
R. 78 W.
R. 77 W.
(Joins sheet 52)
(Joins sheet 62)
(Joins sheet 60)
19
20
21
23
24
25
26
28
29
30
32
33
35
36
Artichoke
AgA
AgB
AmA
Mo
De
Ho
Bv
EaA
EpB
RgD
RhC
Pk
Te
Wa
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
0.5
1
Scale 1:20000

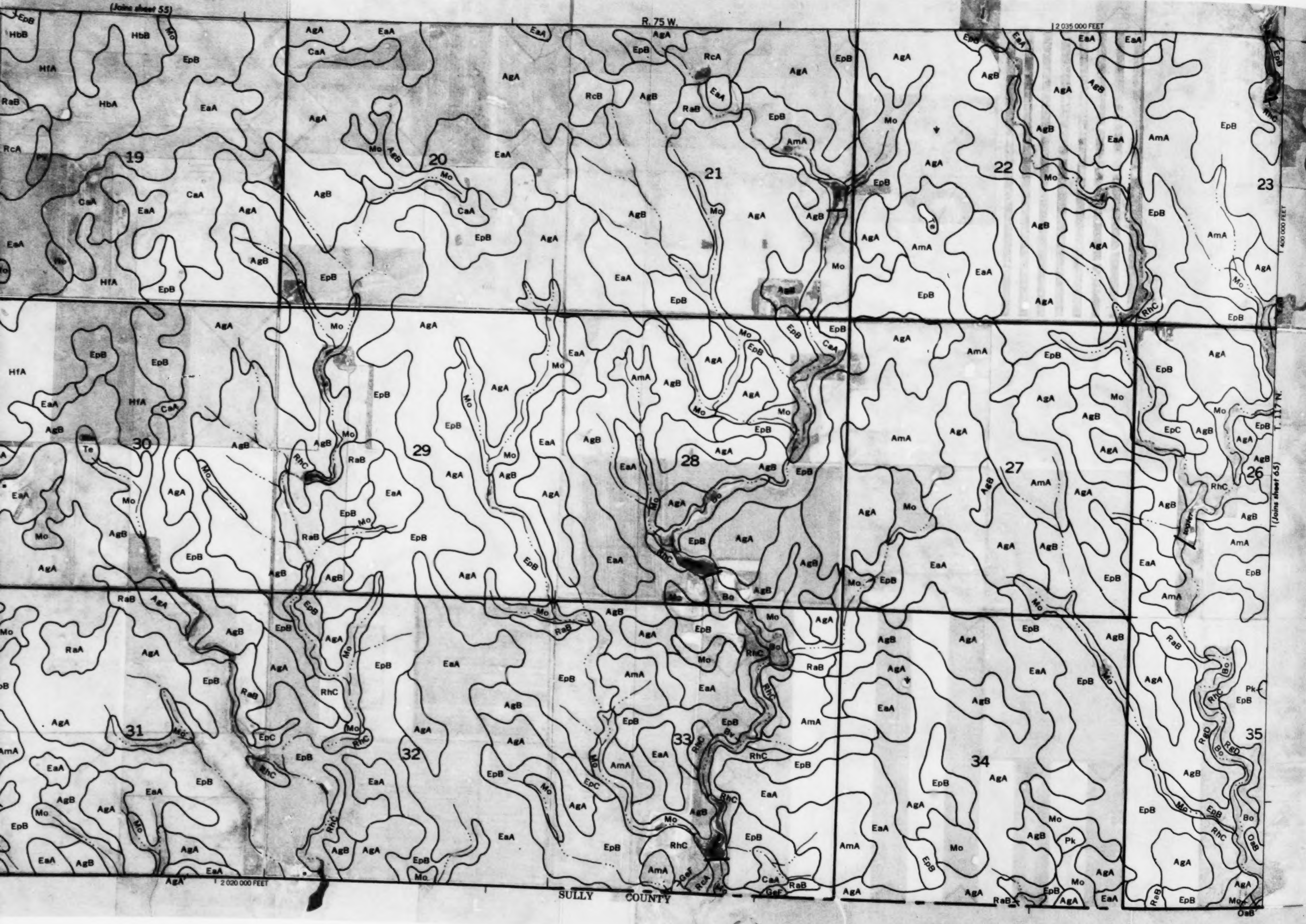
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 62


(Joins sheet 53)
R. 77 W.
R. 76 W.
T. 117 N.
(Joins sheet 63)
(Joins sheet 61)
400 000 FEET
1 970 000 FEET
SULLY COUNTY
83
Artichoke
Creek
22
23
24
19
20
27
26
25
30
29
34
35
36
31
32
AgA
AgB
AmA
EpB
Pk
EaA
De
He
Ho
Mo
Bo
HbA
HbB
HdA
HfA
EaA
EpC
Te
Bv
RgD
ScF
OaA
We
RcA
RaA
AmA

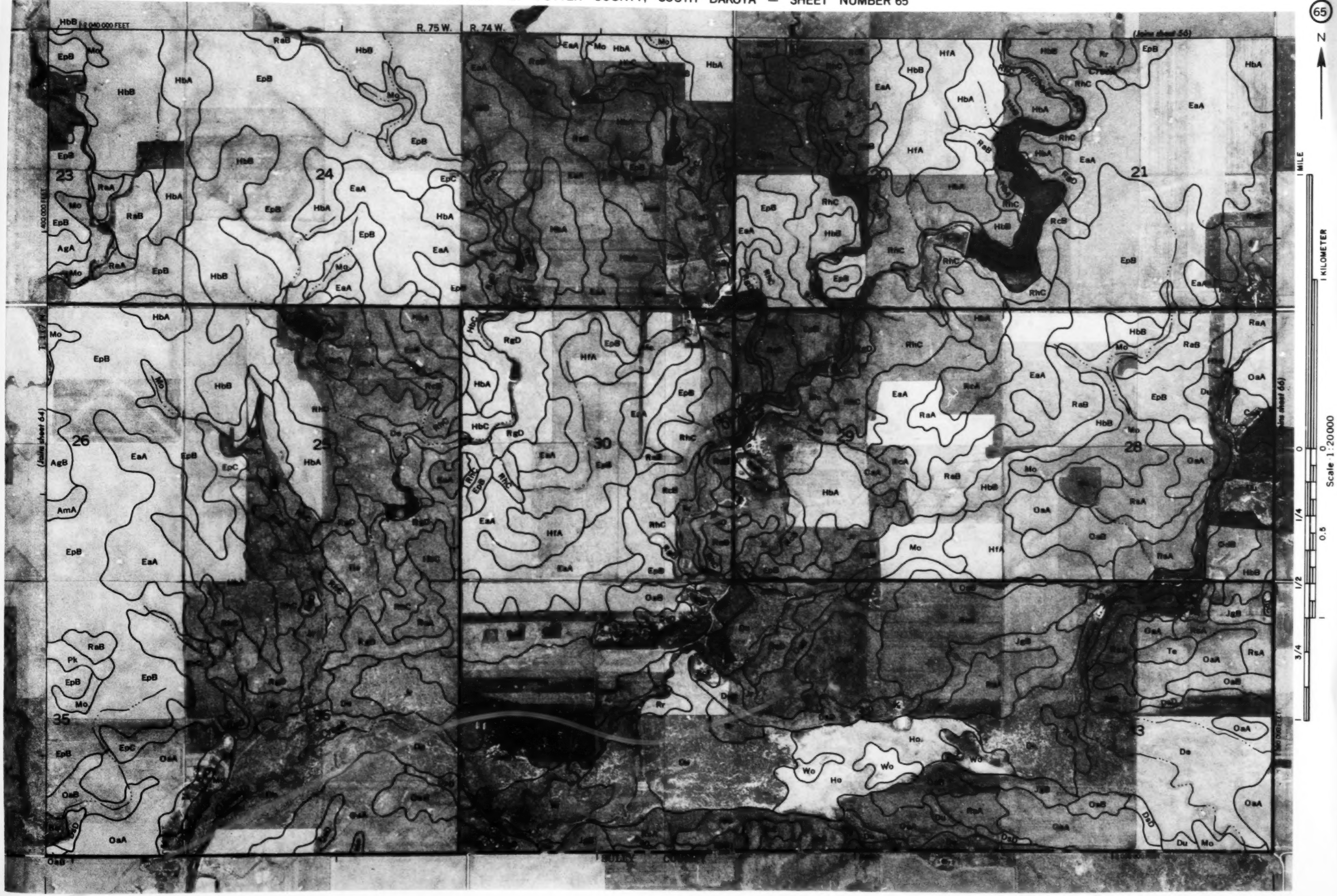
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 63


(Joins sheet 54)
(Joins sheet 64)
(Joins sheet
T. 117 N.
SULLY COUNTY
20
23
24
25
26
27
28
29
33
34
35
36
N
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
1
0.5
Scale 1:20000
390 000 FEET
1 815 000 FEET
400 000 FEET
AgA
AgB
AmA
De
EaA
EpB
HbA
HbB
HdA
HfA
Ho
Mo
Pk
RaA
RaB
RcA
Te

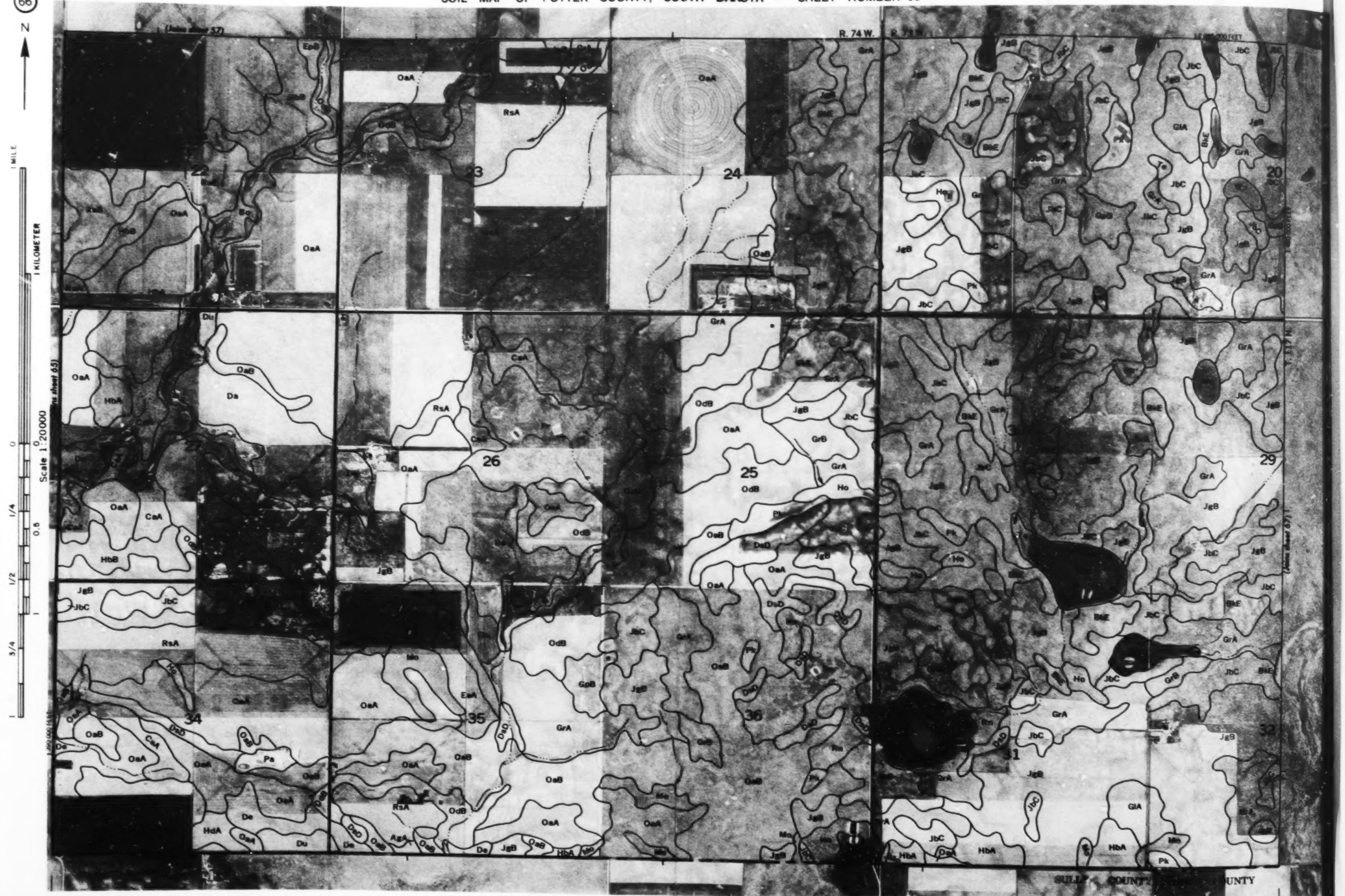
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 64


(Joins sheet 55)
R. 75 W.
2 035 000 FEET
400 000 FEET
T. 117 N.
(Joins sheet 65)
2 020 000 FEET
SULLY COUNTY
19
20
21
22
23
30
29
28
27
26
31
32
33
34
35

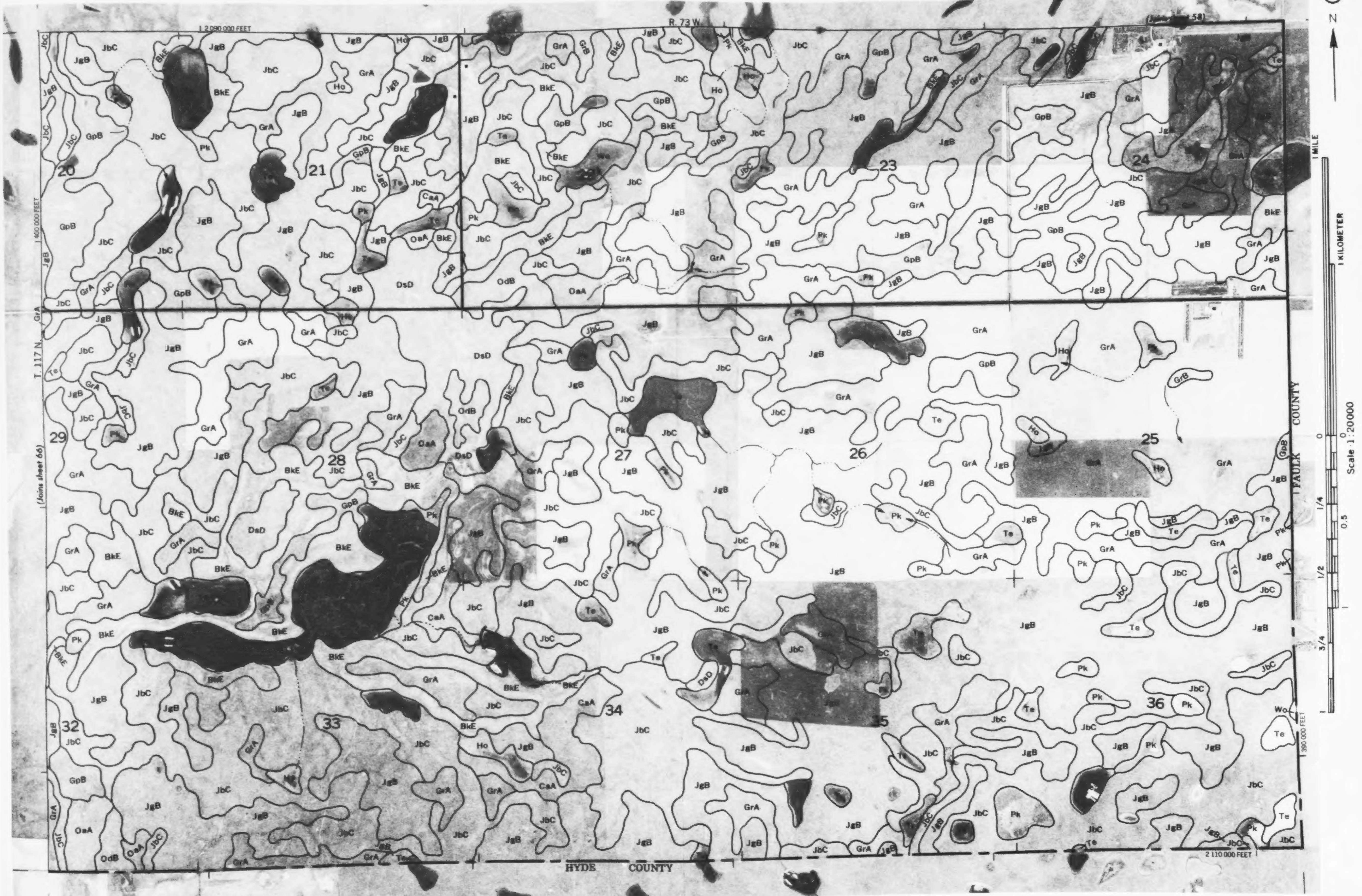
SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 65


65
N
R. 75 W.
R. 74 W.
(Joins sheet 56)
(Joins sheet 64)
(Joins sheet 66)
SULLY COUNTY
1 040 000 FEET
23
24
21
26
25
30
28
35
36
33
1 MILE
1 KILOMETER
0
1/4
1/2
3/4
1
0.5
Scale 1:20 000
HbB
EpB
Mo
HbA
RaB
RaA
EaA
AgA
AgB
AmA
EpC
HfA
RhC
RcB
RgD
HbC
OaA
OaB
Pk
Rr
Ho
Wo
Te
RsA
JaB
De
Du
DaD
CaA
RcA

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 66


N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
(Joins sheet 57)
(Joins sheet 65)
(Joins sheet 67)
R. 74 W.
R. 73 W.
T. 117 N.
20
22
23
24
25
26
29
31
32
34
35
36
OaA
OaB
OdB
RsA
EpB
JgB
JbC
BkE
GlA
GrA
GrB
GpB
Ho
Pk
HbA
HbB
HdA
CaA
Da
DaD
De
Du
Mo
EaA
Pa
SULLY COUNTY
COUNTY

SOIL MAP OF POTTER COUNTY, SOUTH DAKOTA — SHEET NUMBER 67


R. 73 W.
(Joins sheet 58)
2 090 000 FEET
N
1 MILE
1 KILOMETER
Scale 1:20000
0
1/4
1/2
3/4
1
0
0.5
1
T. 117 N.
(Joins sheet 66)
400 000 FEET
390 000 FEET
2 110 000 FEET
FAULK COUNTY
HYDE COUNTY
20
21
22
23
24
25
26
27
28
29
32
33
34
35
36
BkE
CaA
DsD
GpB
GrA
GrB
Ho
JbC
JgB
OaA
OdB
Pk
Te
Wo